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"Shkreli's behavior isn't brand-new; other companies have done it. He just went further"

"They dominate the sports marketplace. They used to be the 800-pound gorilla. Now they're the 795-pound gorilla" "When is a mop the star of a movie, right?"

Bloomberg Businessweek

December 28, 2015 - January 10, 2016

Opening Remarks Martin Shkreli and Big Pharma: Same racket, different scale	10
Bloomberg View How the Saudis can fight terrorism • Uncle Sam and the IMF	12
Global Economics	
Cresting deal mania usually points to a slowdown. Maybe not this time	14
Where defense contractors, the U.K. military elite, and army athletes mix	16
As gas prices fall, Gazprom loses its swagger	17
India's GDP data get recalculated, Chinese-style	18
In Japan, put some yen in the soda machine, and out comes deflation	19
Companies/Industries	
Coupons help pay for drugs. Consumers like that a lot. Insurers don't	21
ESPN wants to make SportsCenter social media-friendly	22
A bell-ringer of a family business that dates back to at least 1339	23
RoboCop. Robo-vacuums. Why not robo-croupiers?	24
Briefs: Reusable rockets; Apple and Ericsson make up	25
Politics/Policy	
Candidates talk Islamic State, but the next president's biggest worry may be China	27
Technology	
Using WhatsApp to combat human trafficking	33
The biggest help yet in preventing football concussions: Woodpeckers?	34
Silicon Valley raids Canada for Al expertise	35
Innovation: Keeping your smart home safe and sound	36
Markets/Finance	
Bond traders wonder how far they can go to make a deal	39
Hong Kong developers offer big incentives—just don't call them price cuts	40
Overstock.com may sell stocks in cyberspace, with an assist from bitcoin technology	41
It takes a heap of energy to grow all that weed	42
Scorecard 2015: Who topped the S&P, which billionaire doubled his worth, and other milestones	43
Features	
Bad Burrito America's healthiest fast-food chain comes down with food poisoning	44
China's Disney Scandal hits the "CEO monk" who made the Shaolin Temple into an empire	50
Pigs Fly U.S. sows head for the Philippines to plump up pork output	56
Coal's Last Stand With Mitch McConnell in the industry's corner, it's not over yet	64
Etc.	
Joy Mangano wants to deck your halls with product	71
Happy Hour: Ere auld acquaintance be forgot, get out the great Champagne	74
The Critic: Downton Abbey's final season brings upstairs and downstairs closer together	76
Health: Enshrine the Squatty Potty next to your porcelain throne	77
Rant: Why force an office Christmas party when colleagues are already buds?	78
What I Wear to Work: The mom style of radio's former Miss Info, aka Minya Oh	79
How Did I Get Here? Cleveland Clinic's Toby Cosgrove went from history major to heart surgeon	80



How the cover gets made

Domestic Cover



"Cover is on Chipotle's recent string of E. coli outbreaks."

"That's scary. First we're told bacon gives us cancer, and now we can't even enjoy the day-altering food-coma haze one can only experience from jamming a 1,700-calorie burrito into one's body. Nothing is sacred."

"What are you thinking for the cover?"

"Can we do a person barfing?"

"That's going overboard."

"What about a burrito barfing?"



International Cover



"Cover is on the presidential candidates and where they stand on China, which has been a recurring topic during their campaigns."

"Who's mentioned China the most?"

"Trump. Mostly in negative terms."

"He usually embraces foreigners."





People/Companies

Cosgrove, Delos

CVS Health (CVS)

Coughlin, Bill

Cruz, Ted

Doio-Labs

Don Quijote (7532:JP)

D	
Davis, Kevin	34
De Freitas, Nando	35
Decision Economics	14
Deloitte & Touche	14
Dentsu Aegis Network	22
Deutsche Bank Securities	6
(DB)	14
Diaz, Fern	78
Diller, Barry	72

80

27

19



1000	
E	
E.ON (EOAN:GR)	17
Ed Miniat Inc.	46
Edwards, Judy	77
Edwards, Robert	77
Ells, Steve	46
Engie Global LNG	17
Ericsson (ERIC)	25
ESPN (DIS)	22
Express Scripts Holdin	
(ESRX)	10, 21
F	
Facebook (FB)	33, 35
Fallon, Jimmy	22
Fellowes, Julian	76
Finergy Capital	27
Fiorina, Carly	27
Fitbit (FIT)	36
Ford Motor (F)	25
Eav Sporte 1 (EOVA)	22

Frazier, Kenneth	10, 21
G	
Gazprom (OGZD:LI)	17
Genting Malaysia (GEN	M:MK)
	24
Glilot Capital Partners	36
Gluskin Sheff (GS:CN)	14
GoDaddy's	43
Google (GOOG)	33, 35
Grossman, Mindy	72
	ĮĽi
н	

Hanson Robotics	24
Henderson Land	
Development (12:HK)	40
Hinton, Geoffrey	35
HNA Group	27
Holm, Holly	22
HSN (HSNI)	72
Huge	78
Hussmann	25
IHS (IHS)	10
IMS Health Holdings (IMS)	21
Ingenious Designs	72
InterActiveCorp (IACI)	72

48
66
39
27
22
22
16
72
51
18
33
39
16
21
25

J



M	
Macy's (M)	72
Mallinckrodt (MNK)	10
Maluuba	35
Mangano, Joy	72
MarketsandMarkets	58
McCarthy, Gina	66
McConnell, Mitch	66
McDonald's (MCD)	46
McGraw Hill Financial (I	MHFI)
	22, 66
Merck (MRK)	10, 21
Microsoft (MSFT)	33
Miller, Alexey	17
Miranne, Tony	72

Moran, Montgomery	46
Mountainside Coal	66
Mukherjee, Ritika Mai	nkar18
Musk, Elon	25
MyDrugCosts	21
N	
Nasdaq (NDAQ)	41
Natural Selection Foods	49
NBCSN (CMCSA)	22
Nelson, Willie	46
Netflix (NFLX)	43
Nielsen (NLSN)	22
Niman Ranch	46
0	
Obama, Barack	27, 66
Obama, Michelle	27, 00
Odwalla	48
Oh, Minya	79
Olbermann, Keith	22
OSI Group	46
Overstock.com (OSTK)	41
Р	
Panasonic (6752:JP)	25
Paradise	
Entertainment (1180:HK	
Parrish, Jesse	66
Patton, Brian	66
Patton, Charles	66
Paul, Rand	27
Paulsen, Jim	14
Peabody Energy (BTU)	66
Pearson, Michael	10
Performance Sports	0.4
Group (PSG) Perry, Ryan	34
Perry, Ryan Pfizer (PFE)	16 10, 14
Pilgrim's Pride	10, 14
Pouyanné, Patrick	49 17
Powell, Doug	46
Putin, Vladimir	51
, •	٥.

QRS

QVC (QVCA)

Ready Foods

Reddit

orldMa

Raytheon (RTN)

22

Modi. Narendra

Moran, Montgomery

46

Reid, Harry	6
Retrophin (RTRX)	1
Rodelis Therapeutics	1
Romney, Mitt	2
Rose, Jimmy	6
Rosenberg, David	1
Rousey, Ronda	2
Rubio, Marco	2
Russell, David O.	7
Salakhutdinov, Ruslan	
"Russ"	3
Samadpour, Mansour	4
Sanders, Bernie	2
Schroeder, Rebecca	5
Shaolin Intangible Assets	
Management	5
	17, 6
Shkreli, Martin	1
Simmons, Bill	2
Sinai, Allen	1
Sizzler	4
Slack	7
Smith, Brandon	6
Smith, David	3
Smith, Maggie	7
SpaceX	2
Squatty Potty	7

		Trump, Donald	27
Ca pagaga	000	Turing Pharmaceuticals	10
	100	Twitter (TWTR) 22, 33	, 35
	- 100		
	- 10	U	
	4		_
	7-2	Uber	25
	4	Union Gaming Group	24
The second second		UnitedHealthcare (UNH)	21
A. Maria		Urban, Keith	72
	A	V	
	1	2.0	_
		Valeant Pharmaceuticals (V	
AM -		10), 21
Charles		Van Pelt, Scott	22
IVN	100	VTB Capital	17
1100			
-		W	
		VV	_
		Web Talent Marketing	78
	-	Wells Capital Management	14
		West, Kanye	79
1		WhatsApp	33
Harry	66	Whiteshire Hamroc	58
phin (RTRX)	10	Whitfield, Ed	66
is Therapeutics	10	Williams, lan	46
ney, Mitt	27		
, Jimmy	66		
nberg, David	14		80
ey, Ronda	22		8
o, Marco	27		78
ell, David O.	72	my cont from	w
chutdinov, Ruslan			361
s"	35	The state of the s	201
adpour, Mansour	46		ы
ers, Bernie	27	197	Ziii
oeder, Rebecca	58		
in Intangible Assets		Xi /	
gement	51	Jinping /	
	17, 66		
eli, Martin	10		
nons, Bill	22	WWZ	
, Allen	14	XYZ	
•	49	Vannavata Madical	24
er		Xennovate Medical	34
. Dooredoo	78		, 51
n, Brandon	66	Yates, Sally	39
n, David	34	Yongxin, Shi	51
h, Maggie	76	YouTube (GOOG)	77
eX	25	ZS Associates	21
tty Potty	77	Zuckerberg, Mark	33

SSR Health

T

Total

Stadium Goods

Stern, Howard

Target (TGT)

Thomson, Russell

Tory, John Toshiba (6502:JP)

Tribe, Laurence

Trump, Donald

Telegram

10

79 **77**

72 33

14 35

25

17 **66**

27

Bloomberg Businessweek

Editorial 212 617-8120 Ad Sales 212 617-2900 **Subscriptions** 800 635-1200 Address 731 Lexington Ave., New York, NY 10022 E-mail bwreader@bloomberg.net Fax 212 617-9065 Subscription Service PO Box 37528, Boone, IA 50037-0528 E-mail bwkcustserv@cdsfulfillment.com Reprints/Permissions 800 290-5460 x100 or

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By Paul M. Barrett

Martin Shkreli's troubles are focusing attention on how the drug industry does business Call it a case of tempting fate or instant karma—the cosmos sought its inevitable revenge when Martin Shkreli, the hiphop-loving, drug-price-inflating biotech executive, was arrested, indicted, and perp-walked on Dec. 17. But the activities that got him crosswise with the feds aren't what the 32-year-old Twitter addict with the sardonic smirk will be remembered for. What's so troubling and important about his story is that

the way he ran his drug companies the amoral but probably legal business plans he employed—were of a piece with mainstream pharmaceutical marketing.

Federal prosecutors described Shkreli's doings as "Ponzi-like" and charged him with fraud, claiming that he fleeced a company he started in 2011 called Retrophin. He allegedly used its stock and cash to pay off investors who'd suffered losses at small hedge funds he'd

previously run into the ground. Unlike the typical Ponzi artist—think Bernie Madoff—Shkreli started real companies that acquired real products and accumulated hundreds of millions of dollars in value, at least in the eyes of Wall Street.

Out on \$5 million bail, Shkreli claims innocence. His PR team took issue with the "Ponzi" label, saying in a statement: "Ponzi victims do not make money, yet Mr. Shkreli's investors enjoyed strong results." Maybe the hedge fund investors got their money back, but Shkreli will have to explain why it was kosher to make them whole with assets that belonged to a publicly traded company. He justifies the shell game by saying he had the blessing of his lawyer, but that lawyer has also been indicted in the case.

However the criminal proceedings play out, Shkreli deserves to remain infamous for the reason he first became notorious. After the Retrophin board ousted him as chief executive officer in 2014, he started another company, Turing Pharmaceuticals. He then acquired Daraprim, a decades-old lifesaving medication for parasitic infections, and hiked the price monstrously, from \$13.50 to \$750 a pill. Defiantly justifying this gambit and vowing to repeat it with other "orphan" drugs for rare diseases, Shkreli turned himself, at least for 15 media minutes, into what the BBC called "the most hated man in America." On that score, he defended himself on Twitter just the day before the FBI showed up at his Manhattan apartment. "If you can afford our drugs with insurance, great," he tweeted. "If you can't, you can have it for free. Our system works."

That claim isn't terribly different from the justification the pharmaceutical industry rolls out whenever it's challenged on drug prices that seem alarmingly high. Granted, Shkreli wasn't typical; most companies don't attempt 55-fold overnight price hikes for treatments that help babies and HIV sufferers. But Shkreli didn't invent the repugnant practice of finding an old drug, jacking up the price, and taking the profits. He just did it on steroids.

Shkreli, who in the wake of the Retrophin indictment resigned as CEO of Turing and was fired from the same job at a third tiny drugmaker, was simply following the lead of companies such as Valeant Pharmaceuticals and Rodelis Therapeutics, which exploit

inefficiencies in the U.S. health-care system. "Shkreli's behavior isn't brandnew; other companies have done it," says Steve Brozak, president of WBB Securities. "He just went further."

Valeant raised the price of two heart drugs, Nitropress and Isuprel, by 212 percent and 525 percent, respectively. Rodelis boosted a tuberculosis treatment to \$360 a pill from \$20, before saying in September it would give up rights to the drug in response to a public outcry. And from 2005 to 2008, Questcor Pharmaceuticals, now owned by Mallinckrodt, raised the price of the multiple sclerosis drug Acthar from \$1,235 a vial to more than \$29,000.

Before returning the rights to the tuberculosis drug to the nonprofit foundation from which it had bought them, Rodelis said that raising prices would ensure "long-term availability" to patients and that it would maintain access for anyone who needed the medicine. A Mallinckrodt spokesman says Questcor increased prices sharply because its infrequently used MS drug had become unprofitable; more recent hikes, he adds, have been modest.

Shkreli's arrest and indictment will encourage better-established pharmaceutical executives to distance themselves from the hoodie-wearing criminal defendant. "To compare us to Turing is ridiculous," Valeant's CEO, Michael Pearson, said in a Dec. 15 interview with CNBC. "That is a single-product company."

"He is not us," Kenneth Frazier, CEO of Merck and chairman of Pharmaceutical Research and Manufacturers of America (PhRMA), the industry's main trade group, said at a Forbes Healthcare Summit two weeks before Shkreli transitioned from pariah to perp.

But while Shkreli is an outlier, mainstream pharmaceutical makers routinely raise prices 10 percent or more a year, much faster than inflation, for drugs aimed at cancer, diabetes, MS, and high cholesterol. Those more modest-seeming increases on widely consumed medications have a vastly greater effect on overall health-care spending than the abrupt inflation of Turing's drug, used by only a couple thousand patients (page 21).

The steady jumps in brand-name drug prices make medicine far more expensive in the U.S. than it is in Canada, Europe, and most of the rest of the developed world, data compiled by Bloomberg and other organizations

His sin was doing what the pharmaceutical industry has always done—on steroids

show. The drug industry has argued—and Shkreli had echoed—that it's misleading to focus on list prices, because they don't include discounts companies strike privately with insurers or patient giveaways.

A Dec. 18 Bloomberg News analysis, done with the assistance of research firms SSR Health and IHS, revealed that even when discounts are factored in, prices for top-selling drugs are significantly higher in the U.S. than abroad. The list price of Merck's diabetes pill Januvia is cut in half on average by discounts, according to SSR Health data. Even so, Merck gets about \$169 for a monthly supply of Januvia, more than twice as much as in Canada, the next most costly place to buy it. Drug companies set their own prices in the U.S.; in most developed countries, governments restrict what can be charged.

"The entire health-care system in the United States is more expensive than other countries," says Robert Zirkelbach, a PhRMA spokesman. Higher U.S. prices, the argument goes, subsidize development costs that benefit patients worldwide, many of them destitute. A Merck spokeswoman says that for competitive reasons the company doesn't disclose the discounts it offers.

Price increases—whether of the Shkreli variety or less in-your-face—are just the way business gets done. That, at least, is the lesson Shkreli learned. The day before his arrest, in an interview about his \$2 million purchase of a one-of-a-kind Wu-Tang Clan album, he told the publication *HipHopDX*: "If you talk to anyone in pharma, maybe I don't have the same resources as Pfizer, I may not have the same experience as Merck, but I'm crafty as f---."

Not quite as crafty as he thought. Now he's serving the useful purpose of holding a mirror up to the rest of the drug business. Addressing more conventional price increases, Steve Miller, chief medical officer for Express Scripts Holding, the largest U.S. manager of corporate prescription-drug benefits, says: "We can no longer sustain a system where 300 million Americans subsidize drug development for the entire world."

—With reporting by Robert Langreth and Doni Bloomfield

Bloomberg View

To read Mark Gilbert on the case for market optimism and Adam Minter on fighting modern slavery, go to

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What the Saudis Can Do to Fight Terrorism

There are things they can do all by themselves without recourse to the new so-called coalition



Saudi Arabia's mid-December announcement that it will create a Muslim nation coalition against terrorism was greeted with faint praise and loud skepticism, and with reason. It turns out that Pakistan had no idea it was part of the alliance, and Afghanistan and Indonesia are only contemplating joining. No Shiite-majority states were invited. And even by standards of international diplomacy, the Saudi statement was vague: It said nothing about what the partners would do or whether any military action was contemplated.

If the Saudis are serious about combating global Islamic extremism, there are many useful steps they could take—beginning by cleaning their own house. For decades, private Saudi money and influence has gone toward creating mosques and schools across the Muslim world that indoctrinate young people into Wahhabism, the Saudi extremist Islamic doctrine. The Saudi influence on terrorists extends to Europe as well. After the *Charlie Hebdo* attacks in Paris last January, French legislators considered a law to ban foreign funding of fundamentalist mosques. Austria has such a law.

While there's little government financing for the export of Wahhabism, the Saudis could do more to stem the flow of private money to "charities" linked to terrorism whose operators the Saudi government shields from prosecution. The kingdom also harbors individuals and companies sanctioned by the U.S. for aiding terrorist organizations.

Saudi Arabia could crack down on extremist clerics at home, and not just those who explicitly back Islamic State. Hateful ideology is so prevalent in the kingdom that it's no wonder at least 2,500 Saudis have joined Islamic State. Saudi leaders should also fulfill their promise to remove from state-issued textbooks passages so intolerant—including instruction on how best to execute heretics and homosexuals—that Islamic State has downloaded them for children in its territories.

As it begins a campaign against extremism, Saudi Arabia

should end its crackdown on free speech. One law, for example, equates open demonstrations and insults to the state as terrorist acts. The blogger Raif Badawi has been sentenced to 10 years in prison and 1,000 lashes for merely calling for moderation.

Saudi Arabia could also fight terrorism by redoubling efforts to make peace with the Houthi rebels in Yemen. That country's continuing disintegration makes it a hotbed for terrorism. Finally, Saudi Arabia should fulfill its obligation to provide air support and financial aid for the fight against Islamic State in Iraq and Syria. It now averages only a single airstrike per month.

In the so-called Jeddah Communique of September 2014, Saudi leaders have already sworn to "cut off the resources for terrorists" and become a "model" for addressing extremism. That's a promise they can make good on all by themselves.

Congress Should Care About the IMF

The U.S. is a glum bystander when it should be taking a leadership role in the key organization

The elephantine spending bill passed by the U.S. Congress on Dec. 18 includes, among its numberless provisions, a measure that's shamefully overdue. Since 2010, Washington's paralysis has blocked badly needed changes at the International Monetary Fund. The bill will let them go forward.

This is good news. It serves U.S. as well as global interests. But the protracted delay draws attention to a deeper problem, still unresolved: Rather than lead the IMF in its vital work, the U.S. continues to settle for the role of glum bystander.

Five years ago, IMF members agreed, among other things, to increase the fund's financial resources and rebalance countries' voting power—mainly by shifting votes from Europe and giving more say to big emerging economies, notably China. Congressional approval is only now being granted.

An effective IMF is an essential tool in promoting global economic stability. It can support governments that lose access to financial markets, demanding fiscal and other reforms in return. It's also a forum for international policy coordination. These roles assume enormous importance in times of global systemic stress. Its record isn't flawless, but nobody who's given it a moment's thought questions the fund's necessity.

The U.S., out of negligence rather than calculation, has said it isn't much interested in having an up-to-date IMF and can't be bothered to recognize the new standing of China and other big emerging economies. The sum of Washington's thinking on the IMF is, in effect: "Who cares?"

Buried along with who knows what else in the mammoth bill, the IMF provisions have not been properly debated or explained to voters. The case for an effective, adequately resourced and well-run IMF is compelling, and the U.S. government should be making it—the better to modernize and lead the institution. **⑤**

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2015 gained the distinction of becoming a record year for mergers and acquisitions. The Big Pharma deal, by far the year's largest, pushed 2015 past the \$3.4 trillion mark in global M&A value set in 2007, just before the financial crisis. That beat the previous record, set in 2000, which also came right before the economy fell into recession, pulled down by the dot-com collapse.

A flurry of corporate dealmaking is "a classic late-cycle development," says David Rosenberg, chief economist at Gluskin Sheff, a Toronto money manager. "When companies embark on peak M&A activity, it is more often than not coinciding with a peak in the stock market and, dare I say, a peak in the business cycle. Companies are telling us they can no longer grow organically." The dollar value of deals in 2015 through Dec. 21 was \$3.8 trillion.

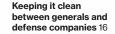
During six and a half years of expansion, the U.S. economy has averaged

easiest way for executives to boost share prices has often been to increase dividends and buy back stock.

That strategy worked to a degree. Even with lackluster economic growth, the stock market has almost tripled since its March 2009 low. Yet corporate profits peaked in the summer of 2014. With consumer demand still weak around the world, sales growth remains elusive. Rather than trying to generate revenue themselves, companies have been buying growth instead, acquiring rivals at an unprecedented pace.

The near-term impact of a merger boom tends to be negative for the economy, Rosenberg says. The watchwords of corporate M&A-cost-cutting and synergies-usually translate





Gazprom fights to protect its market share in the EU 17 A better way to measure India's growth 18

Economic data from vending machines in Japan 19

Big Questions

into people losing jobs. "The idea is to take capacity out of the system and generate better returns for shareholders," he says. "I don't think I've ever seen a merger that didn't involve job losses."

Judging the longer-term impact of all these deals is trickier. Some will invariably turn out to be mistakes. "In a world where borrowing money is virtually free, you're probably doing more of these deals than you should," says Jim Paulsen, chief investment strategist at Wells Capital Management.

But a surplus of deals doesn't mean a recession is lurking nearby. Given how bizarre this recovery has been—almost seven years of weak growth despite record-low interest rates—"I'm not sure the same lessons apply this time around," Paulsen says.

For one, the current flood of deals is more U.S.-centric than previous ones. So far this year, mergers and acquisitions made by U.S. companies have accounted for almost \$2 trillion in deals, more than half the global total. European

targets made up the smallest share of global acquisitions in 17 years, 21 percent, or only \$785 billion. That gives many corporate watchers confidence that M&A isn't overheating, because it's mostly focused on the world's strongest economy.

This year's rush is also noteworthy for the number of transactions valued at more than \$10 billion, says Russell Thomson, who leads Deloitte & Touche's U.S. M&A practice. By his calculation, it's about double the number of high-priced mergers during the previous peaks of the past 15 years. "That is quite staggering," says Thomson, who points out that this year's crop is more evenly spread across the various parts of the economy, "instead of being concentrated in one or two industries."

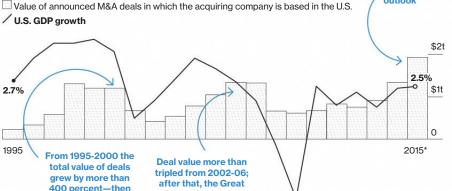
Earlier recessions were preceded by ever-riskier dealmaking in single industries. Such focus led to financial imbalances as too much money poured into one part of the economy. Think of the dot-com bubble that burst in 2000 or the 2008 crisis that devastated households, homebuilders, and banks. This time the lack of dealmaking focused on one industry lowers the chance of a recession. The average expansion



A Harbinger of Tough Times?

again, but most economists maintain a rosy outlook

Recession began



*M&A VALUE THROUGH 12/21/15

The value of deals is rising

■ since World War II has lasted less than five years. Joseph LaVorgna, chief U.S. economist at Deutsche Bank Securities, rejects the idea that recoveries "die of old age. They die of imbalances, and right now I'm not seeing a lot of imbalances."

came a recession

Every recession is different, but they all tend to have the same main ingredient: inflation. Despite an abnormally long recovery and rates near zero, inflation is very low. So is growth. The average forecast among economists surveyed by Bloomberg is for the U.S. economy to expand 2.5 percent in 2016. That makes LaVorgna nervous: "I'm more worried over the inability to generate decent economic growth than I am over what this M&A boom is signaling."

From a corporate standpoint, with so much cash flooding the system, acquisitions have become less risky given most companies' lower cost of capital, says Stephen Morrissette, who teaches M&A strategy at the University of Chicago Booth School of Business. "You really have to overpay for something, for a deal not to end up adding value."

Rather than a warning of weaker growth, some economists see the record M&A activity as the opposite. "I think it's a sign of strength in the U.S.," says Torsten Slok, chief international economist at Deutsche Bank. "Corporate America's appetite for risk is finally beginning to thaw.

Even if activity slows down next year, I think we are still two or three years away from a recession," he says. Allen Sinai, chief global economist of Decision Economics, agrees. "If anything, this is a sign of maturation. It's as if this recovery is just reaching puberty. Chronologically, it's old, but functionally, it's still very young." — Matthew Philips

The bottom line An M&A wave can signal an economic downturn, but this record-breaking cycle may not follow the script.

Defense

The New, Open Way To Sell Arms

- The U.K. invites contractors to support army athletics
- "It's as clean as we can make the damn thing"

Champion cyclist Ryan Perry, a British army captain, was uncharacteristically tipsy the night of Nov. 25, but no one could blame him for enjoying the Champagne. Standing on the stage of a grand 15th century hall in London, the 28-year-old cradled a crystal plaque naming him the army's sportsman of the year. Seated in front of him was one of the British military's most influential officers, the

CGS. "Yesterday I was riding around Burnley in the wind and rain," Perry told the crowd, referring to his seaside hometown.

"Tonight I'm drinking Champagne with CGS."

Attending the banquet were executives from at least 20 contractors for the U.K.'s Ministry of Defence—including U.S.-based arms manufacturers **Boeing**, **Lockheed Martin**, and **Raytheon**. They raised glasses with senior military officials, many of whom are directly involved in spending some of the \$268 billion in defense procurement the U.K. has planned for the next decade. The contractors paid for the black-tie dinner in the historic Guildhall.

The corporations are sponsoring the dinner through Team Army, a charity established in 2011 after an antibribery law went into effect in the U.K. The law was enacted following a string of highprofile corruption cases, including some in defense deals. Team Army's role is to be in the middle of what were once unofficial big-dollar transactions between generals and defense companies. "It's as clean as we can make the damn thing," says Lamont Kirkland, a general who ran the army's boxing, rugby, and winter sports programs before retiring to lead the charity.

Arms makers and other contractors pay Team Army as much as £70,000 (\$104,000) for memberships. The members sponsor tables or buy tickets for Champagne receptions and other fêtes. Corporate suites at premier soccer games, rugby matches, and horse races are also used to raise money. Contractors are invited to spend time at the events with the top brass who buy their wares.

The charity uses money from the contractors to fund military sports programs, Paralympics, and elite military athletes. Top-draw competitions, including the annual army-navy rugby match at London's 82,000-seat Twickenham Stadium, are used for more fundraising. Although the official numbers won't be public until 2016, Team Army raised a record amount this year, Kirkland says. Since 2011 the charity has amassed about \$4.5 million for military sports.

When Kirkland commanded the army's 4th Division and simultaneously ran army sports programs, he says he saw a system rife with conflicts. Generals directly solicited money from their contractors to sponsor individual sports or events, while some companies offered funds on their own.





FROM A BLOOMBERG SURVEY OF ECONOMISTS. DATA: COMPILED BY BLOOMBERG DEALS ARE COMPLETED OR PENDING AND INCLUDE DEBT; 2015 GDP GROWTH FIGURE IS THE AVERAGE FORECAST

OM LEFT: COURTESY BOEING; COURTESY KREMLIN

None of it was transparent, he says.

Team Army was created to become "the third-party entity" that handled "commercial arrangements between the generals and the defense contractors" when sports sponsorships were involved. Kirkland says everything has been vetted by lawyers and the Ministry of Defence to comply with regulations and the Bribery Act. "I get the toxic combination of generals, defense contractors, money, and hospitality-it's a bed of snakes," Kirkland says. "So what we're trying to provide here is a mechanism and a process that keeps the thing as clean as possible, given that the activity is going to take place."

Team Army's most opulent activities include almost three weeks of skiing in the French Alps for the army and navy, as well as the combined forces' winter sports championships in January and February. The charity advertises the events as the premier networking opportunity for the services. For the final week, the group invites company representatives to join "VIPs from all three services" for what it calls "a fully hosted experience on and off *piste* in our catered hotel."

On Nov. 23 the U.K. published its first long-term military spending review since 2010, including its plan to pledge that \$268 billion for gear and support over the next decade. One big unanswered question: whether

the army air corps will upgrade its Apache helicopters-made by Boeingor pursue a new system. The former deputy commander and operations director of the Joint Helicopter Command was seated at Boeing's table for the Nov. 25 awards, according to the event's seating plan. (A former Apache commander who's at the Joint Helicopter Command also was scheduled to sit with Boeing, but didn't attend, the company says.) Boeing sponsors sports programs in the air corps through Team Army, Kirkland says. In an e-mail, the company said, "Boeing is proud to support Team Army and those who take part in its activities as part of our wider support for the U.K.'s Armed Forces."

The chopper commanders were to stay at Boeing's table all night, according to the seating plan. Some

senior officers at Boeing's table and elsewhere rotated to other tables in the great hall between dinner and the awards ceremony, the plan showed. Kirkland says that wasn't about maximizing contractor access to military brass, but giving officers the chance to thank as many sponsors as they could. "There's a very credible and important imperative to meet as many of your sponsors as possible during the evening," he says. —Cam Simpson and Benjamin D. Katz

The bottom line Contractors and officers know they'll face more scrutiny under new rules as the U.K. prepares major increases in military spending.

Energy

Gazprom Is Losing Its Market Muscle

- Competition forces the Russian energy giant to make nice
- "Gas diversification became a mantra for both the EU and Russia"

Gazprom, the state-controlled, Moscow-based natural gas giant has long played a double role: as an instrument of Kremlin foreign policy; and as a major source of tax revenue for

Vladimir Putin's government.

Things have changed.
Gazprom has long been accustomed to dictating terms because of its size. In the European Union, it supplies about 30 percent of the gas. But with a 70 percent drop in profits, the Russian company finds itself fighting to protect its share of a market it depends on for as much as a third of its revenue of \$100 billion. Gazprom is no longer a potent diplomatic tool at a time when customers have many more options.

By 2025, says the International Energy Agency (IEA), gas imports by the EU will account for 77 percent of its consumption, up from 63 percent now. Gazprom will not necessarily be supplying Europe with those extra imports. American companies will be providing liquefied shale gas to European power plants starting next

year. "U.S. shale gas will provide a very important opportunity for European consumers to strengthen their hands," says Fatih Birol, executive director of the IEA. U.S. exports may make up half of flexible liquid natural gas volumes heading to Europe by 2020, says Philip Olivier, chief executive officer of Engie Global LNG, a shipper of flexible LNG. "Flexible" means the gas can be shipped anywhere.

It's not just America. "There will be competition between American gas, Russian gas, Algerian gas, Middle Eastern gas," Total CEO Patrick Pouyanné said in October. In response, Gazprom has dropped the bluster and threats it used with European clients that protested Moscow's actions in Ukraine last year and whose governments imposed sanctions on Russia. (The Western sanctions don't restrict purchases of Russian natural gas.) Instead, the company is paying more attention to customer needs, announcing plans for a pipeline that would transport its gas directly to the EU and pushing to settle an EU antitrust claim that could cost it billions of dollars.

The new approach complements Russia's attempts to ease tensions with the West over Ukraine and boost

cooperation in fighting terrorists in Syria. Those efforts have met with limited success, but Russia is persistent. "The position of Gazprom and the

Russian side is becoming flexible in light of the changing situation, defending our interests but also taking into account the demands of the European side," says First Deputy Energy Minister Alexey Teksler.

Gazprom is trying both to appease the Europeans and look for new customers. "In the aftermath of the Ukraine crisis, gas diversification became a mantra for both the EU and Russia," says Simone Tagliapietra, energy fellow at Bruegel, a think tank in Brussels. But "Russia needs the EU gas market as much as—if not more than—the EU market needs Russian gas."

Gazprom's room to maneuver is limited. All the gas for Europe is shipped by pipeline, meaning Russia can't divert it to other markets. Links to China aren't expected to be built until after 2019.

European side"

Global Economics

■ Russia shelved plans to turn Turkey into a conduit to Europe after the Turks downed a Russian warplane near the Syrian border in November.

Gazprom's "export policy has always been balanced and adaptive," says spokesman Sergei Kupriyanov. He argues that European customers have become more interested, not less, in Russian gas, given Europe's own decline in production.

The Kremlin's traditional hardline approach to customers was on display last year when tensions over the crisis in Ukraine led to the worst breach in relations with the West since the Cold War. "Europe has lost," Gazprom CEO Alexey Miller declared after Russia signed its first gas supply deal with China. He said another deal would come in the "nearest future" that would allow Russia to redirect some EU-bound gas from deep in West Siberia to Asia.

In September 2014, Gazprom started to limit gas deliveries to some EU members, including Poland and Slovakia. They had been supplying gas to Ukraine to replace supplies that Russia had cut off in a pricing dispute with its neighbor. Russia warned that the conflict with Kiev could disrupt supplies to Europe, as had happened in 2006 and 2009. In both those epi-

sodes, Gazprom cut off The position of gas to Ukraine. Because Gazprom and the Russian side is Europe got most of its becoming flexible Russian gas via Ukraine, in light of the Gazprom's actions changing situation, defending our imposed shortages on interests but also the EU as well. taking into account the demands of the

In January 2015, Miller told the EU's new energy chief, Maros Sefcovic, that Gazprom would cut

off shipments to Europe via Ukraine after the current pipeline contract ran out in 2019. That would force customers to build new pipelines. "We don't work like this," a stunned Sefcovic told reporters in Moscow.

But since the spring, the pressure has been growing on Gazprom. The plunge in gas prices has begun to bite. Gazprom expects revenue in Europe in 2016 to be down 16 percent, the lowest in 11 years. Its giant Siberian fields are operating far below capacity. It says production this year will fall to a record low because of weak demand, primarily from

Ukraine, which isn't buying much.

In April, Brussels unsealed an antitrust complaint alleging Gazprom sold gas to Poland and the Baltic states at prices up to 21 percent higher than the average. If the charges are proven, the gas giant could pay as much as \$3.8 billion in fines, VTB Capital in Moscow estimates. Gazprom denies all the charges.

In negotiations to export more gas to China, talks have stalled. After a September visit to China again failed to yield a deal to expand shipments, Gazprom hastily signed a pact with five big EU companies including oil major **Shell** and utility **E.ON** to build a pipeline under the Baltic Sea to Germany. Russian officials say they're ready to offer lower prices to gas customers that help fund construction, as well as concessions to ensure the pact wins EU approval. The company later made a formal offer to settle the EU's antitrust charges.

Miller has publicly backed off from threats to cease shipments via Ukraine after 2019. Gazprom is also giving in to European clients' calls for more pricing flexibility. Slowly, Gazprom is learning how to operate like an ordinary company that has to work on its customer relations. —Elena Mazneva, Anna Shiryaevskaya, and Kelly Gilblom, with Ilya Arkhipov, Tino Andresen, and Alex Morales

The bottom line As Russia tries to defuse tensions with the West, Gazprom is blustering less and promising more.

GDP

In India, Growth Data Served Chinese-Style

- A Mumbai brokerage tracks car sales and power consumption
- ► What the GDP data are saying "doesn't quite add up"

Indian economists have adapted Chinese Premier Li Keqiang's approach to figuring out economic growth, which involves scrutinizing data from various industries instead of relying on the official figure for gross domestic product. The picture painted by what the Indians are calling the Keqiang index is more downbeat than the official data from Delhi, which started using a new way to calculate GDP in January.

When he was a regional official in China, Li examined electricity consumption, rail cargo volumes, and loan disbursements to take the pulse of the

6%

Private estimate of India's year-over-year GDP growth for the latest quarter; the official calculation is 7.4 percent economy. He told U.S. ambassador Clark Randt in March 2007 that such data captured the reality of growth better than "man-made" GDP, according to classified documents published on WikiLeaks.

Mumbai-based stock brokerage **Ambit Capital** introduced a Keqiang-inspired index in September, when doubts over the reliability of India's GDP figures were increasing. The government's numbers showed the country's economy outpacing China's. Says Ambit analyst Ritika Mankar Mukherjee, who worked on the firm's Keqiang index, "The GDP data is telling you something that doesn't quite add up. Everything you know from corporate captains, from corporate management, from the government machinery, is telling you that the economy is slowing down."

Ambit's Keqiang index combines motor vehicle sales, power consumption, capital goods imports, and cargo handled at airports to capture private consumption and investment demand. The index shows the growth of motor vehicle sales decelerating to 0.5 percent last quarter, from 2.4 percent over the previous three months.

Although the government reported that the overall year-over-year growth rate had accelerated to 7.4 percent in the three months through September, from 7 percent in the prior quarter, Ambit estimates a deceleration to 6 percent, from 6.3 percent. A top government economic adviser, Arvind Subramanian, in a Dec. 18 press conference defended the independence of the statistics office while acknowledging the uncertainty economists and investors feel about the official measurement of GDP.

Ambit says the slowdown reflects Prime Minister Narendra Modi's efforts to break India's dependence on the old growth model. "You'll have smaller subsidies coming from the central government, you'll have a smaller black economy, and you'll have crony capitalism curtailed to some extent," Mukherjee says. "While each of these resets will be very positive for the country from a long-term perspective, all of this in the short term is extremely negative for GDP growth." —Sandrine Rastello

The bottom line The government says India's economy grew 7.4 percent last quarter, but actual business activity suggests otherwise.

Consumption

Vending Machines in Japan Sell Deflation

- The ubiquitous machines are locked in a soft-drink price war
- Many people "are still attached to the idea of low prices"

Japan has vending machines everywhere: in the capital's vast network of train and subway stations, at Kyoto's historic shrines and temples, on Okinawa's remotest islands, and even on Mt. Fuji. With 5 million of them, about one for every 25 people, Japan has the most vending machines per capita in the world—double the rate in the U.S. The machines sell train tickets, flowers, and fried chicken, among other items. More than half offer soft drinks, making beverages the industry's largest category. They're also an economic indicator.

The soft-drink vending machines exemplify how difficult it is to stamp out the deflation that's stifling growth in Japan. Government data show the prices of soft drinks are at their lowest since 1976. About one in three machines has reduced prices, according to Tokyo-based beverage researcher Inryou Souken. At one machine at the main intersection of Tokyo's fashionable Shirokanedai

neighborhood, a half-liter supersize

or the equivalent of 82¢. The stan-

dard soft drink price for all vending

can of Coca-Cola sells for only 100 yen,

Vending machines in Japan sell beer, burgers, underwear, ramen, umbrellas, razors, floral arrangements, toy cars, toasted sandwiches, fresh eggs, neckties, and batteries



machines is 130 yen. That's the price at suburban locations and in train stations, where competition is limited.

Operators of the soft-drink vending machines have been locked in a price war with supermarkets and discount

retailers for years. After the government hiked the sales tax in April 2014, many vendors chose to lower prices further to soften the blow of the tax. "There's a great many people who are still attached to the idea of low prices," says Takeshi Minami, an econo-

mist at Norinchukin Research Institute in Tokyo. "It's deeply rooted."

With the recovery still fragile, budget-conscious consumers are increasingly packing drinks from home when they go out. When they purchase them, they tend to buy at supermarkets and convenience stores offering deep discounts. That pressures vending machine operators to lower prices, says Yano Research Institute in Tokyo.

The competition is intense: A half-liter bottle of Coke goes for 75 yen (55 with a coupon) at a Don Quijote discount retailer across the street from the Shirokanedai vending machine. Whoever wins the marketing war in soft drinks, the depressed prices that result will help keep deflation alive in the Japanese economy.

—Kevin Buckland and Kyoko Shimodoi

—Kevin Buckland and Kyoko Shimodo

The bottom line The prices at Japan's soft-drink vending machines demonstrate how hard it is for the government to curb deflationary forces.



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Companies/ Industries

December 28, 2015 - January 10, 2016

This is SportsCenter (in your face, everywhere, all the time) 22

A foundry that's rocked the bells for hundreds of years 23

Briefs: Greener rockets; a leaner Toshiba 25

Gambling on a

robot 24

That Drug Coupon Isn't Really Clipping Costs

- "Free" copays spur sales of branded medicines, with insurers unhappily footing the bill
- ▶ "It is a brilliant marketing strategy" that sidesteps efforts to discourage expensive remedies

When Valeant Pharmaceuticals **International** ran a TV ad after this year's Emmy Awards broadcast featuring actor Mario Lopez promoting its new antifungal toe treatment, Jublia, the spot drew some barbs. But it's also lured plenty of curious consumers who heeded the company's invitation to visit the drug's website for savings. There they found an online coupon that promised no out-of-pocket costs for eligible patients. That's a great deal for consumers, because the prescription medicine costs more than \$1,000 for an 8-milliliter bottle. It's an offer many of their insurers would prefer to refuse.

Jublia's marketing tack is part of a high-stakes game of chicken in which insurance companies raise copays on some drugs to as high as \$100 to discourage their use, only to see pharmaceutical companies pick up the tab for those copays—seeking to leave insurers on the hook for the balance, often in the hundreds and sometimes thousands of dollars per monthly prescription.

"It is a brilliant marketing strategy" on Big Pharma's part, says Adriane Fugh-Berman, an associate professor of pharmacology and physiology at Georgetown University, who's been a paid witness in lawsuits against some drug companies. She calls the practice an "insidious" way to circumvent insurance companies and employers who increasingly are trying to get patients to share the pain of soaring drug prices. Valeant didn't respond to requests for comment.

In 2015 the pharmaceutical industry will spend an estimated \$7 billion—up from just \$1 billion in 2010—to hand out coupons and discount cards to cover some or all patient copayments for drugs from fibromyalgia pain treatments to brand-name diabetes pills, according to data from IMS Health Holdings.

Research shows that the amount of money consumers have to shell out for pharmaceuticals affects their willingness to buy a medicine. When patients

have a copay above \$50, they're more than four times as likely to abandon a prescription at the counter than when they have no copay, according to a 2010 study published in the *Annals of Internal Medicine*. The power to influence patient choices is one reason copay coupons are disallowed entirely in the federal Medicare program, where they're considered an illegal inducement.

Drug companies say they're just making the drugs more affordable for consumers. Patients could be stuck paying 20 percent or more of a drug's price in the form of a copay, compared with about 7 percent of the cost of a physician visit or 4 percent of a total hospital bill, says **Merck** Chief Executive Officer Kenneth Frazier. "What we want to be able to do is help patients who need products and can't afford to get them," he says. "Coupons can be helpful in that sense."

Holly Campbell, a spokeswoman for the trade group Pharmaceutical



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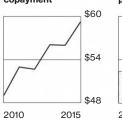
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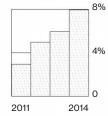
Big Pharma Wants to Make You a Deal

• Drug costs for patients are rising, leaving some reluctant to buy More companies are offering coupons to spur sales, and patients are using them

Average drug copayment*







The share of purchases of Crestor, a top-selling branded cholesterol pill by AstraZeneca, made using coupons is increasing

Crestor coupon penetration

16.7%

First half of 2015

*DRUG AVERAGE COPAYMENT FOR A 30-DAY PRESCRIPTION FOR NONPREFERRED BRANDS IN FOUR-TIER PLAN DESIGN

■ Research and Manufacturers of America, concurs. "Copay offset programs can play an important role in maintaining access to needed medicines, especially for patients taking specialty medicines or with chronic conditions," she says. "Today, too many patients find that they are facing very high cost sharing that puts their ability to stay on a needed therapy at risk."

Altruism aside, picking up copays is very good business for drug companies. Manufacturers can earn a 4-to-1 to 6-to-1 return on investment on copay coupon programs, according to the Pharmaceutical Care Management Association, which represents pharmacy benefit managers, the companies that manage drug plans for insurers and employers.

Copay coupons—which can be paper coupons, discount cards, or electronic

codes used at pharmacies are distributed through company websites, magazines, and doctors' offices.

Insurance companies and the prescription benefits managers they work with are fighting back, dropping drugs from "What we want to be able to do is help patients who need products and can't afford to get them. Coupons can be helpful in that sense."

— Merck CEO

Kenneth Frazier

their plans. And consultant Dan Pollard, who started MyDrugCosts to consult with employers about lowering their health-care expenses, is developing a rewards program that would provide a cash incentive to patients who eschew coupons. "We're changing the economics for the consumer," he says.

Pharmacy benefit managers such as Express Scripts Holding and CVS Health have increased bans on some drugs, partly in response to the proliferation of coupon programs. Express Scripts will exclude about 80 drugs from its largest formulary in 2016. That's up from 48 medicines in 2014. CVS will exclude about 120 drugs in 2016.

UnitedHealth Group, the nation's largest health insurer, with about 46 million members, has been one of the industry leaders in combating copay

Up from 2.8 percent in the first half of 2013

coupons. In 2013 the insurer started blocking the acceptance of them for six expen-

sive specialty drugs, including medicines for multiple sclerosis, rheumatoid arthritis, and hepatitis C, according to consultant ZS Associates. Since then, UnitedHealth has expanded that nocoupon list to 35 specialty drugs, adding medicines for growth hormones, pulmonary hypertension, and infertility.

All the drugs have options that are more affordable, according to Lynne High, a spokeswoman for UnitedHealth. Manufacturer coupons "can drive patients away from lower-cost, therapeutically equivalent alternatives and can significantly increase overall healthcare costs," she says.

Studies have produced mixed results over whether the benefits coupons provided to consumers outweigh the higher costs they may incur. The coupons are most controversial when used for everyday drugs. One 2013 analysis in the *New England Journal of Medicine* found that 62 percent of coupons studied were for brand-name drugs for which lower-cost alternatives were available. Older medicines to treat toe fungus, for example, can

be had for \$30 or less, a fraction of today's new branded

prescription remedies.

When low- or no-copay promotions are used for very expensive specialty drugs, though, such as medicines for rheumatoid arthritis and multiple sclerosis that can cost \$2,500 a month or more, a 2014 study in *Health Affairs* found, coupons reduced a consumer's share of the drug cost to less than \$250—and usually much less. That's low enough that patients were more likely to continue taking needed prescriptions.

For pharmacists who've seen the discount cards and coupon programs proliferate over the years, the punch-counterpunch between insurers and drugmakers seems like more trouble than it's worth. "These cards are put out to level the playing field for the consumer," says Andy Miller, an independent pharmacist in Brattleboro, Vt. "We're creating systems within systems. Maybe drug companies should just lower the pricing." —Cynthia Koons and Robert Langreth

The bottom line The pharmaceutical industry will spend an estimated \$7 billion this year on coupons to offset insured patients' copays for their drugs.

Media

ESPN Slips as Social Media Feeds Fans Clips

- ► SportsCenter, the flagship highlights show, is retooling itself
- "They didn't have a plan for this whole next generation of stuff"

When Ultimate Fighting Championship star Ronda Rousey was viciously knocked out by Holly Holm in a bout in November, the clip seemed like the perfect highlight to feature on **ESPN**'s *SportsCenter*. Yet by the time the program showed footage, many fans had already followed the fight live on Twitter and seen the clip on Reddit.

That's a challenge for ESPN and SportsCenter, the flagship show introduced to pay-TV audiences 35 years ago. ESPN is the dominant sports outlet on TV and the Web, especially for livesports telecasts, and the single biggest profit contributor to parent Walt Disney. But competition from social media and other channels is eating into its audience for news and highlights, SportsCenter's bread and butter.

"ESPN is so valuable because they have the most valuable live-sports

Heritage Marinelli Bells

This family business in Agnone, Italy, has filled the belfries of churches around the world since at least 1339. Today, the foundry's 12 artisans take about three months to produce a single large bell. A 600-kilogram (1,323-pound) model costs about €21,000 (\$23,000). Tourists can take home a less hefty holiday edition for €40.



Pressing a wax decoration onto a bell

→The molds are created in a centuries-







- ↑ The bell's core is shaped in clay with the help of broken bricks
- ← An artisan chisels fine details into the cast

In 2004, Marinelli replaced the 400-yearold bell in the Leaning Tower of Pisa



content," says Liam Boluk, a media strategist at Jason Hirschhorn's *Redef*, a media industry newsletter. "But the rest of their programming is under the same pressures as the rest of the industry." So the network is revamping *SportsCenter* for mobile viewing and online sharing, as well as rolling out new editions.

In February, ESPN will present a 7 a.m. EST edition of *SportsCenter* to try to encourage viewers to watch on mobile devices on their way out the door, says Rob King, ESPN's senior vice

president for news. "Our producers have spent a lot of time working with our talent to really think about which audience we're seeing through the course of the day," he says. The show is still relevant, he says, and fans want to watch—"it's a matter of where they are and how they consume it."

In September, Scott Van Pelt, a longtime ESPN anchor, began hosting a new midnight edition of *SportsCenter* to try to compete with late night talkshow hosts such as Jimmy Fallon and Jimmy Kimmel. The show is experimenting with new segments, including one for bettors. A recent ad urging fans to "end your day on a highlight" shows a college student watching *SportsCenter* on a tablet from a fraternity house rooftop.

In a recent note to clients, Rich Greenfield, an analyst at BTIG Research, wrote that it's hard to fathom fans tuning in to *SportsCenter* to watch highlights when scores and footage are readily available online throughout the day. The sports leagues themselves increasingly have eaten into

GE: DAVID PAUL MORRIS/BLOOMBERG; OPPOSITE PAGE: ILLUSTRATION BY 731; PHOTO: COURTESY FORD GLOBAL TECHNOI

■ SportsCenter's audience by using social media to post game highlights and scores, according to Greenfield.

Viewership for live editions of SportsCenter—the network airs

761k

Average audience for the 11 p.m. EST edition of *SportsCenter* this year through Nov. 15, down from 849,000 two years ago repeats throughout the day—is down 10 percent this year, according to ESPN, and down 13 percent for the pregame show *Sunday NFL Countdown*. Overall viewership has fallen 10 percent in

2015, though network executives say that's really 4 percent if you exclude World Cup and Nascar events, which boosted ratings in 2014 and didn't air this year. In addition to live games, ESPN airs talk shows and original programming such as the 30 for 30 documentary series.

Viewership at **Fox Sports 1**, a cable network owned by 21st Century Fox that debuted in 2013, is up 14 percent this year, with an average prime-time audience of about 286,000. At **NBCSN**, with an average audience of 274,000, viewership has increased 25 percent this year. Still, both networks draw only a fraction of ESPN's 1,535,000, according to Nielsen data.

Live game telecasts have helped ESPN stay on top of the cable-TV landscape as the No.1-rated network. In prime time, which is dominated by live sports, ESPN's audience is up slightly over the past two years. Its Monday Night Football telecasts outdraw all other networks on that night of the week. ESPN also commands the highest monthly rate of any cable channel from pay-TV services, at \$6.64 per subscriber, according to media research firm SNL Kagan. "Our relative advantage in the marketplace is stronger than it has been in a long, long time," says Artie Bulgrin, the network's senior vice president for global research.

In October the network eliminated about 300 jobs worldwide. Over the past year, it has parted with several on-air personalities, including Keith Olbermann and Bill Simmons, who says the number of people canceling pay-TV service caught ESPN by surprise. "I don't think they ever

saw it coming," Simmons said on his podcast in November. "They didn't have a plan for this whole next generation of stuff." An ESPN spokeswoman says Simmons wasn't privy to internal conversations about the company's future.

ESPN executives say they are prepared for the changing media land-scape and are faring better than some entertainment-oriented channels. The network's digital audience, which isn't counted in the ratings, is growing, according to ESPN, and its WatchESPN app, available to paid-TV subscribers, has boosted the *Monday Night Football* audience by 1.5 percent. Earlier this month, the network unveiled live streaming on its main app, which alerts mobile viewers "when something great is happening on *SportsCenter*," says ESPN's King.

Advertisers are following ESPN's audience online. Amplifi, a division of the ad agency Dentsu Aegis Network, which handles media buying for Microsoft, General Motors, and Home Depot, has shifted some spending to ESPN's digital channels, according to Andy Donchin, Dentsu's chief U.S. investment officer. "If you want to reach men, it's kind of hard not to buy ESPN," he says. "They dominate the sports marketplace. They used to be the 800-pound gorilla. Now they're the 795-pound gorilla." —Gerry Smith and Lucas Shaw, with Christopher Palmeri

The bottom line Live telecasts have kept ESPN the top-rated cable channel, even as its audience moves online.

Casinos

She Has a Pretty Face But No Heart

- Robot dealers at casinos could shave labor costs
- Can nonhuman dealers "tap into the gamblers' psychology"?

The croupier has an hourglass figure, an unflappable manner, and a friendly face. Yet it's uncertain whether Min, a would-be dealer, can win over the hearts and minds of finicky gamblers. That's



because Min is a robot introduced at a casino trade show in Macau in November. Min's creator, **Paradise Entertainment**, a Hong Kong-based manufacturer of gaming machines, says the device could help the big gambling palaces cut payrolls and even open new markets.

Paradise Entertainment Chairman Jay Chun says scanners located in card shoes-the boxes where shuffled cards are stored before dealing-enable his robots to recognize the hands that have been dealt. The bots are also more efficient at dealing cards, typically distributing 30 percent more than a human can in any given period, says Chun, who declined to say how much they will cost. More advanced models will incorporate face-recognition capabilities so customers, especially high rollers, get more personalized service, such as being greeted by name or even spoken to in their native tongue.

One potential market for the devices is the U.S., where casinos' labor costs are proportionally higher than at establishments in Asia. Chun says Paradise Entertainment is talking to possible overseas buyers but didn't identify them.

Electronic table games without dealers are a growing segment of the North American gaming industry, says Christopher Jones, a senior gaming analyst at Union Gaming Group. Installing electronic table games such as baccarat, roulette, and the Asian dice game sic bo can help casino operators reduce their staffing needs on low-stakes games and during slow periods. Also, Jones says, novice customers may seek out automated tables to avoid embarrassment if they make a mistake.

Robots can be a good solution in gambling jurisdictions where real dealers are banned, says Carlos Siu, an associate professor at the Macao Polytechnic Institute's Gaming Teaching and Research Centre. Genting Malaysia's Resorts World Casino in New York City, for instance, uses electronic table games to get around state gambling laws that bar human dealers, Jones says.

In Macau, the world's largest gambling hub, machines are less likely to pass muster. Asian customers are more inclined to gamble in a noisy and crowded environment, preferring to

The number of

employees Camden

Town Brewery plans

bought by AB InBev.

The London-based

the deal gives it the

resources to open a

second brewery

craft beer maker said

to hire after being

banter with their dealer than to sit in front of a machine that provides no human engagement, Siu says. "Gamblers often slam the table and shout loudly to pump up the mood," he says. "I'm not sure if robotic

dealers can tap into the gamblers' psychology correctly and give an appropriate response."

Besides, a slowdown in Macau's gaming industry may result in an oversupply of human croupiers, Siu says. Under Macanese law, only residents of the Chinese territory can be hired for such jobs, and local unions have lobbied the government to maintain this restriction. Even so, Hanson Robotics has sold one of its robotswhich is interactive and can make facial expressions-to a Macau casino operator, says Jeanne Lim, the Hong Kong-based company's chief marketing officer. She declined to say which company bought it. —Daniela Wei

The bottom line Robot dealers in casinos can handle 30 percent more cards in a given period than their human counterparts.

Edited by James E. Ellis and **Dimitra Kessenides** Bloomberg.com

Briefs

By Kyle Stock

Returning to Sender

 \blacksquare The recycling race is heating up in space. On Dec. 21, Elon Musk's SpaceX launched a Falcon 9 rocket that put 11 satellites into orbit before returning to land vertically in Florida. A few weeks ago, Jeff Bezos's Blue Origin performed a similar feat, though its vessel didn't carry satellites. Reusable rockets are expected to drastically reduce the cost of space launches.

CORRECTIONS Naughty list: The New York Fed is calling for a registry of traders and bankers with ethical violations. The roster

would be circulated

departments.

among Wall Street HR

Toshiba, rocked by one of Japan's biggest accounting scandals in 2015, said it would eliminate 7,800 jobs, roughly 4 percent of its workforce, and sell its health-care division in a bid to stem losses. Most of the layoffs will be in its con-

> sumer electronics and appliances unit. The company said it would post a loss of about \$4.5 billion in the year ending in March. ● ← Ride-hailing startup *Lyft* filed plans to raise as much as \$1 billion in

a funding round. Venture capital experts

have put Lyft's prefunding valuation at \$4 billion to \$4.5 billion. Rival *Uber* is seeking to raise an additional \$2.1 billion, which would give it a \$62.5 billion valuation. • • Panasonic said it's buying Hussmann, a maker of refrigeration systems, for \$1.5 billion. The deal helps the Japanese electronics giant pivot away from TVs and smartphones and toward products and **CEO**

services that might interest corporate customers. Missouri-based Hussmann makes coolers for food distributors and retailers.

• 2 Apple signed a global licensing agreement with Ericsson, ending an almost yearlong patent dispute between the telecommunications giants. Apple will pay Ericsson an undisclosed sum over seven years for the rights to a number of patents used to speed wireless networks.



Wisdom

thinking like an inventor, they can't turn that off." Ford Global Technologies CEO Bill Coughlin, explaining a 36 percent increase in the carmaker's annual patent applications

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Politics/ Policy

December 28, 2015 - January 10, 2016

President Obama has visited China

times since taking office in 2009



Xi Jinping has visited the U.S.

2

times since taking office as president of the People's Republic of China in 2013

It doesn't rival Islamic State or abortion as an issue in the presidential race, but **China** might be the most complex challenge the winner will have to deal with.

0	
2014 GDP	
1. U.S.	\$17.4t
2. China	\$10.4t
3. Japan	\$4.6t
4. Germany	\$3.9t
5. U.K.	\$3.0t
	DATA: IMF

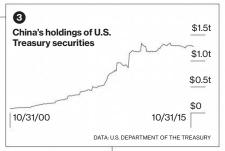


34%
12%
4.8%
4.5%
3.5%

The country, which has the world's second-biggest economy and second-highest military spending, is a frenemy of the first order. It finances America's federal budget deficit by buying Treasury bonds, and it sends more students to the U.S. than

any other nation. It's a natural ally on some issues (Islamic terrorism) but an implacable foe on others (freedom of navigation in the South China Sea).

President Obama will bequeath his successor a string of partial successes. China, the biggest greenhouse gas polluter, agreed with the U.S. to curb emissions, albeit ▶



CO₂ emissions 2011 (kilotons)

1. China	9.2m
2. U.S.	5.3m
3. India	2.1m
4. Russia	1.8m
5. Japan	1.2m
	DATA: WORLD BANK

304,040
Chinese students at U.S. schools for the 2014-15 academic year

6

didn't retaliate after the U.S. Navy cruised by contested islands in the <u>South China</u> <u>Sea</u> in October, but the country's Ministry

of National Defense didn't hesitate to accuse Washington of a "serious military provocation" on Dec. 19, days after a pair of B-52 bombers

flew over Chinese-built artificial islands in the same area. The share of Americans who regard China unfavorably went down slightly in 2015, after ticking up for several years. But China is determined to assert its

years. But China is determined to assert itself—and challenge U.S. supremacy—on many fronts over the next four years and beyond. "Any candidate has to treat them with nuance, or should," says Ted Truman, a nonresident senior fellow at the Peterson Institute for International Economics.

So far, nuance has been missing from the campaign. Donald **Trump**, the leading Republican in the **polls**, speaks of China primarily as a cheater. It's not a new line of attack—2012 Republican nominee Mitt **Romney**, whose Bain Capital backed companies that helped outsource jobs to China, described the Chinese in the same terms.

Americans' views of China

Favorable

Unfavorable

20%

Data PEW RESEARCH

of Republicans in a
Dec. 18 poll said they'd
vote for Trump

DATA: PUBLIC POLICY POLLING



"China has cheated. I will not allow that to continue." —Sept. 25, 2012, Vandalia, Ohio

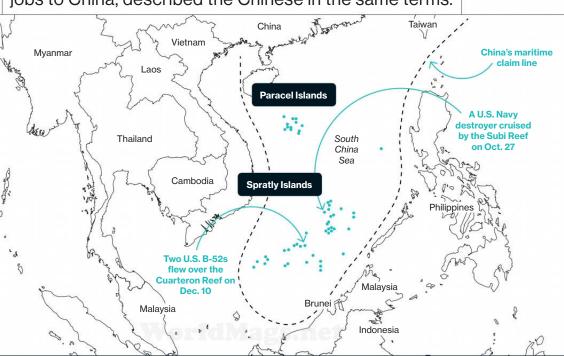


"It's the greatest theft in the history of the world what they've done to the United States. They've taken our jobs." —Nov. 3 interview, Good Morning America

Uncharted Waters

China's territorial claims conflict with those of Brunei, Indonesia, Malaysia, the Philippines, and Vietnam. It has refused to submit the disputes to arbitration by the International Court of Justice in the Hague.

Disputed islands





The deficit widened

even though U.S.

exports to China grew

over the period

U.S. merchandise trade

-\$100b

-\$200b

-\$300b

-\$400b

2014

DATA: INTERNATIONAL TRADE ADMINISTRATION

deficit with China

2002

Trump's dark view of China could have something to do with his personal history. In 2005 the Hong Kong majority partners in a Trump-branded housing development on New York's Upper West Side sold the project

without his approval, for what he regarded as too little money. He sued, and the case was settled out of court.

The leading Democrat, Hillary Clinton, sounds nearly as hawkish on the subject of Beijing. As Obama's secretary of state from 2009 to 2013, she introduced the "pivot to Asia" policy, designed in part to prevent Chinese hegemony in the region. At a New Hampshire event last July, shortly after it was revealed that China was behind a massive electronic intrusion into U.S. Department of State personnel records, she accused the country of "trying to hack into everything that doesn't move in America."

Clinton has been tough on Chinese trade practices as well, going back to her experience as a U.S. senator from New York. In 2004 the Chinese Ministry

of Commerce made a formal complaint to the World Trade Organization accusing Corning, based in upstate New York, of "dumping" optical fibers on the Chinese market at below cost. Clinton invited Chinese officials to her Senate office to discuss the matter, and personally raised the issue with the White House. China dropped the case the next year, deciding instead to

exempt Corning from import duties. "She tends to be harder on China than her husband was," says Jeffrey Bader, who was chief adviser to the Obama administration on China until 2011 and has remained close to Hillary.

China is a litmus test for how the presidential candidates would govern on a broad range of issues. Are they isolationists or interventionists? Do they see <u>foreign policy</u> as a job for the White House or for Congress? How would they strike a balance between concern for human rights and the economy? Which constituency do they most aim to please—business, labor, religious groups, ▶

Hillary Clinton

"China represents one of the most challenging and consequential bilateral relationships the United States has ever had to manage."
Oct. 11, 2011,
Foreign Policy

Key elements of the pivot to Asia:

Alliances

Emerging partners
Regional institutions

Trade and investment

Military presence

Democratic
development

People-to-people ties

DATA: STATE DEPARTMENT FACT SHEET



"We can't let them be dumping products into the American market." —July 23, West Columbia, S.C.



LOCKWISE FROM TOP LEFT: JA

Shameless. #Freethe20 hrc.io/1KDkyFz -H

Rubio

"I will instruct all U.S. officials meeting with their Chinese counterparts to demand the unconditional release of political prisoners." -Aug. 27 Wall Street Journal op-ed



"In America, we should stand with victims of oppression." -Nov. 4 Senate floor speech



"They have thrown **Nobel Peace Prize** winners in iail.' -July 27, Simi Valley, Calif.



'The U.S. must work with regional allies to significantly increase our military presence in region. -campaign website

As a member of Congress in the 1990s. Kasich successfully pushed for limits on the B-2 bomber program



"It's a very complex place... the Chinese are there, as well as the Russians, and you have all kinds of factions there." Nov. 10 GOP debate is an issue that cuts across party lines. Clinton has repeatedly raised concerns about China's record, most vividly in September, when she criticized President Xi Jinping during a visit to the U.S., which included a White House state dinner in his honor. That enraged the Chinese. Republicans, including Ted Cruz, Marco Rubio, and Carly Fiorina, have been no less harsh. In contrast, Trump and Bernie Sanders, Clinton's chief Democratic rival, rarely mention Chinese human-rights issues in their speeches—though Sanders has contrasted China favorably with the U.S. on paid maternity leave, a position that drew him a rebuke from the actor James Woods, who called the senator an "utter moron."

The question of how to respond to China's displays of military strength offers a clearer picture of what the candidates are about than their grandstanding on what to do in the Middle East. Chris Christie, Fiorina, and Rubio have taken a neoconservative tack on foreign policy, indicating they'd be more willing than others to use force to defend American interests and promote Western democratic ideals in Asia as well as in the Middle East, John Kasich, who declared war on Pentagon waste while in Congress, has nonetheless favored military spending to counter China. Ben Carson hasn't had much to say about China as a strategic threat at all, except to suggest it's played a part in Syria's civil war.

Rand Paul, a libertarian, is leery of foreign entanglements. In Syria he opposes a no-fly zone that could put the U.S. in direct conflict with Russia. On China, he's adamant that the U.S. should avoid responding to its shows of strength with a big military buildup. That veers fairly close to the policy advocated by Sanders, who focuses on iobs and little else when it comes to China. His spin is that "billionaires" are shipping jobs from the U.S. to China to take advantage of lower wages, at the expense of workers in both countries.

If history is a guide, the candidate who wins in November

Chris

"I'll tell you this, the first thing I'll do with the Chinese-I'll fly Air Force One over those islands. They'll know we mean business." -Nov. 10 GOP debate



"China is our rising adversary." -July 27. Simi Valley, Calif.



"My first goal is to restore America's strategic advantage in the Pacific.' -Aug. 27 Wall Street Journal op-ed



"I want America to be great and strong, and nobody should dare to attack us, but at the same time I don't want to be hollowed out." -Nov. 10 GOP debate



"I want to see the Chinese people do well, but I do not want to see the collapse of the American middle class ... and I will fight against that." -campaign website



is likely to be more moderate in office than he or she was on the campaign trail. "Chinabashing is part of American campaign politics, and we get that," says Tao Wenzhao. senior researcher at the Institute of American Studies, part of the Beijing-based Chinese

Academy of Social Sciences. President Richard Nixon, a fierce anti-communist, broke the ice with Chairman Mao Zedong by traveling to Beijing in 1972. Presidents Reagan, Clinton, and George W. Bush also talked tougher on China during their campaigns than they acted once in office.

Jeb Bush, the onetime GOP front-runner, is one of the few candidates willing to signal a moderate approach to China. He understands the importance to Chinese leaders of saving face. On a business trip in 2013, he found himself having to explain why they shouldn't be offended that First Lady Michelle Obama had decided not to join her husband to meet with President Xi and his wife on their visit to California that year. (The first lady cited the end of her daughters' school year.) His father. George H.W. Bush, was the U.S. envoy to China from 1974 to 1975. Britton Hill Holdings, the private equity firm Jeb Bush created in 2013, raised millions from investors including China's HNA Group, based in the island province of Hainan, and Finergy Capital, a Beijing-based private equity fund. (Bush stepped down from his role with Britton Hill when he declared his candidacy.)

The U.S. can't simply tell China what to do, no matter how much any president may want to. "Be tough," says Bader, the Clinton adviser. "But China is an increasingly powerful country that has its own interests, and it

doesn't listen to us." With less than a year to go before the election, China may remain obscured by more visceral issues. But count on this: When the next presidency begins, no puzzle will be more important. • Peter Coy, with Michael C. Bender, Mark Glassman, Natalie Kitroeff, Ting Shi, and Joe Sobcyk



"We also have to have an ongoing, deep relationship with China. We have to stay engaged. It's so easy to create misunderstandings." -Feb. 18, Chicago

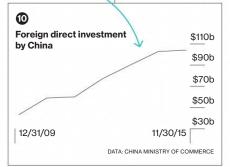


Bush's Britton Hill Holdings raised more than

from foreign investors for two separate funds

On Dec. 21, Zimbabwe said it would adopt the yuan as legal tender after China canceled

in debt



Honorable Mentions

Number of times candidates have said "China" in the top-tier debates



Ben Carson



Chris Christie



Bernie



Ted Cruz



John Kasich



Jeb Bush



5 Marco



Rubio



Rand Paul



Carly Fiorina



Donald Trump

Total

Number of times candidates said "terrorist." "terrorists," or 'terrorism"

Edited by Allison Hoffman Bloomberg.com

Bloomberg Businessweek Design 2016

April 11, 2016 Yerba Buena Center San Francisco

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Technology

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December 28, 2015 - January 10, 2016



Messaging apps are helping some women escape human trafficking

"It's a lifeline, and an important one"

Sophie Otiende is a late adopter. It was only last summer, she says, that she became obsessed with her smartphone. Even so, she had a better excuse than the rest of us for constantly checking her device. Otiende is a consultant in Nairobi with the nonprofit Awareness Against Human Trafficking. By last spring, 31 womenin a group spread across war-torn Libya and linked via social media-had found her on Facebook through the organization and asked for her help. The first thing she could do, the endangered women told her, was join their group chat on WhatsApp.

Soon, Otiende was using the free messaging app to provide information to each of the women in Libya, who'd met in person or found one another through social media over several weeks and formed a support group. Many said they were afraid for their lives and

needed a way out, so Otiende and her colleagues began supplying them with the directions, paperwork, and points of contact needed to flee to Kenya, with assistance from the Kenyan Ministry of Foreign Affairs & International Trade and the International Organization for Migration. By December 2014, all 31 women had escaped sex slavery and begun building new lives in Kenya, according to Otiende. "They risked everything," she says. "We were constantly worried about them. But we were able to communicate."

In some ways, the Internet and social media have fueled the problem of human trafficking around the world. It's never been easier to buy or sell forced labor. The International Labour Organization says it's a \$150 billion market victimizing some 21 million people—4.5 million of whom are sexually exploited. At the same time, many

victims have access to mobile devices, and increasingly, trafficked women are using messaging services to get help.

"If you're vulnerable and isolated, the more important that cell phone becomes for you," says Mark Latonero, a fellow at the Data & Society Research Institute in New York, who's studied technology and human trafficking. "It's a lifeline, and an important one."

Many abused or trafficked girls and young women are given phones as a way for their abusers to keep tabs on them, says Jameela Nishat, founder of the Shaheen Women's Resource and Welfare Association, a nonprofit shelter in Hyderabad, India. Nishat says 10 of her volunteers use WhatsApp to communicate with about 100 women and girls who wouldn't be safe trying to meet with a door-to-door caseworker. "It helps them tell us things," she says. "They can share with us the good and

ROM LEFT; COURTESY COLUMBIA PICTURES; COURTESY PERFORMANCE SPORTS GROUP; GETTY IMAGES; ILLUSTRATION BY 73:

Technology

■ the bad." Through mobile messaging, Nishat says, the women and girls living in confinement can seek education, medical treatment, and counseling, as well as emotional support. Like Otiende, she's also used it in more dramatic cases, giving step-by-step guidance for escape or rescue.

The women also use apps such as **Line** and **Telegram**, but most often they mention WhatsApp, which had

"The messages say,
"We're here to help
you if you need it,'
and it gives a high
reliability of actually
reaching someone."
—Gordon Gow,
University of Alberta

900 million users as of September. Facebook, which paid \$22 billion for WhatsApp in 2014, didn't respond to requests for comment for this story. When the company announced the acquisition, Chief Executive

Officer Mark Zuckerberg said part of WhatsApp's appeal was that it could be a kind of "911 for the Internet."

Human-rights advocates say social media services could do more to block traffickers from advertising and soliciting young people on their sites. In 2011, **Microsoft** offered six grants totaling \$185,000 to researchers focused on the role of technology in trafficking. That same year, **Google** gave \$11.5 million in grants to 10 antitrafficking and antislavery organizations.

With an eye to trafficking victims who have only disposable "burner" phones and can't use apps, University of Alberta communications professor Gordon Gow and his students comb classified ads at sites such as Backpage .com for the phone numbers of sex workers, then send them SMS text messages with contact info for the Centre to End All Sexual Exploitation. Gow says about 10 percent of the 5,000-odd messages his team has sent have elicited a response-some a simple "thank you," others asking for more detailed assistance, such as referrals to police or rehab facilities.

Each blast-typically from 100 to 300 messages-costs the organization \$10 in wireless charges, Gow says.

"From our point of view, this is a practical and cost-effective way of directly reaching this population," he says. "The messages say, 'We're here to help you if you need it,' and it gives a high reliability of actually reaching someone."

Reaching someone is just the beginning, Otiende says. In Kenya, her organization is helping the Libya escapees find jobs, shelter, and counseling for post-traumatic stress. Migrants, refugees, and other displaced people remain particularly vulnerable to slavers, she says: "The problem is that we always feel two steps behind where the traffickers are."

The next frontiers, says Otiende, include Instagram, Twitter, and YouTube. Her group is trying to put as much of its resources online as possible, to help more people in Kenya and elsewhere. "To fight, we need to be able to stay up to date with what's out there," she says. "We need to be able to evolve." —Mary Pilon

The bottom line Trafficked women and the nonprofits trying to help them are turning to messaging apps to share information.

Sports Medicine

Lessons From Bird Brains

- An anti-concussion collar draws inspiration from woodpeckers
- "The market is giant. It's a huge unmet clinical need"

The doctors who discovered that football can cause brain damage are the heroes of **Concussion**, which opens in theaters on Dec. 25. Now one of them may be on the verge of another breakthrough. Dr. Julian Bailes, played by Alec Baldwin in the film, is part of a team that's created what might be the first device to cut down on concussions.

Spoiler alert: It's not another hightech helmet. Helmets are good at preventing skull fractures, but they can't prevent concussions. That's because

> the brain floats in fluid inside the skull, like an egg yolk inside a shell. No matter how well the outside is padded, the brain is still damaged when it sloshes against



the sides of the skull during a collision. Bailes's innovation is a collar that lightly constricts the jugular vein, which has the effect of reducing the jiggle room inside the cranium. In October, Performance Sports Group, the maker of Bauer ice hockey equipment and Cascade lacrosse helmets, licensed the technology; it plans to start selling the bands within a year or two, subject to approval by the U.S. Food and Drug Administration. "The market is giant," says Kevin Davis, chief executive officer of the Exeter, N.H., company. "It's a huge unmet clinical need."

The lightbulb moment came in 2007. Dr. David Smith, CEO of **Xennovate Medical**, had just wrapped up a presentation on wound dressings. Someone in attendance suggested he look at brain injuries: "If somebody can figure out how a woodpecker can smash its head into a tree and fly away without a headache, we'd probably have the problem solved," Smith recalls the person saying.

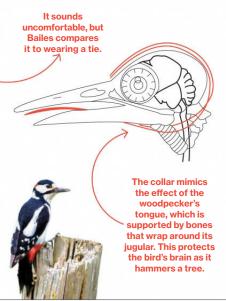
He began studying woodpeckers. One of their most unusual features is a long tongue, which in some species is supported by bones that wrap all the way around the head. Smith theorizes these compress the woodpecker's neck veins as it thrusts its head forward, increasing the volume of blood between its brain and its skull. Smith says this extra fluid "works like Bubble Wrap" to help keep the brain from knocking against the skull. He was convinced that the same effect could be reproduced in humans, perhaps with some kind of collar.

Smith contacted Bailes to share his



• The plastic collar fits around the back of an athlete's neck, leaving the windpipe exposed.

- The collar applies pressure to the jugular vein, causing a slight backup of about a teaspoon of blood in the head.
- The added blood leaves less space for the brain to move during a collision, reducing the possibility of a concussion.



theory in 2009, after watching him testify before Congress about head injuries in the NFL. The team doctor for the Pittsburgh Steelers from 1988 to 1998, Bailes was among those who raised the alarm about chronic traumatic encephalopathy, a brain disease that wreaks havoc on the lives of former players. The two men met and decided to run some tests on animals. "We went to Michaels arts & crafts and made a collar that would fit a rat," Bailes recalls.

A standard test in brain damage research involves dropping brass weights on the heads of anesthetized rats, then inspecting their brains for tearing in the connections between nerve cells. Bailes told Smith that previous experiments found nothing reduced the damage in rodents' brains by even 1 percent. "No matter what we put between that ball that comes out of the sky and that rat's skull—we've put rubber, we've put steel, Kevlar—nothing changes," says Smith, quoting Bailes.

Subsequent tests showed that rats with the jugular-constricting bands had 80 percent less damage than those without. Three years ago, Smith and Bailes enlisted Dr. Gregory Myer at the Human Performance Laboratory at Cincinnati Children's Hospital to test the device on humans. He recruited about 60 high school football players, gave half of them collars, and measured changes in their brains over the course of a season. The results will be detailed in a paper that Myer plans to submit for publication early next year.

Chris Nowinski, executive director

of the Concussion Legacy Foundation, says, "It will also be extremely hard to prove this device works, as there will be a massive placebo effect." Says the former pro wrestler: "Impressionable high school athletes, when given this collar and told it prevents concussions, will report fewer concussions."

Myer's preliminary data were apparently strong enough to interest Performance Sports Group, which has committed \$7 million. CEO Davis is so confident of the band's effectiveness that he's having his son wear it during hockey games. —Zeke Faux and Ira Boudway

The bottom line A device worn on the neck may help prevent concussions by reducing the jiggle room between the cranium and the brain.

Hiring

Canada's Al Experts Head South

- U.S. companies recruit its artificial-intelligence scientists
- ► The country's lead is "slipping away right under our nose"

Canada, with a tech industry one-third the size of California's, has become a leader in the booming market for artificial intelligence. Pioneering technologies developed in Canadian labs can be found in **Facebook**'s facial-recognition algorithms, used to tag people in images, **Google**'s Photos app, and smartphone voice identification.

Over the past three years, a handful of leading Canadian researchers and professors, superstars whose AI work will underpin everything from self-driving cars to smart prosthetic limbs, have defected to U.S. tech companies and universities, taking their expertise, and often their students, with them. Canada's losses could undermine a decade-long effort by the national and provincial governments to leapfrog other countries in artificial intelligence.

University of Toronto computer science professor Geoffrey Hinton spent decades building the techniques now used in image- and speechrecognition systems. He and two of his students joined Google in 2013 when the company bought an imagerecognition startup Hinton co-founded. Nando de Freitas, who taught computer science at the University of British Columbia, developed techniques for data analysis that are now being used by Google's skunkworks AI division, DeepMind. He joined the company in the U.K. in 2014 and occasionally teaches at Oxford. Ruslan "Russ" Salakhutdinov, also in the computer science department at the University of Toronto, has done groundbreaking work that lets computers identify objects after seeing only a small set of examples, mimicking how young children learn. He's joining the machinelearning department at Carnegie Mellon University in the spring.

"We had a lead in a field that is potentially going to be very important... and it's slipping away right under our nose," says Ajay Agrawal, a professor at the University of Toronto's Rotman School of Management.

In the mid-2000s the government-backed Canadian Institute for Advanced Research (Cifar) in Toronto funded work on a then-obscure and unproven technology, neural networks, which helps computers learn to write their own programs for complex tasks, including image recognition and speech processing. A small group of researchers made several breakthroughs that wound up in a range of commercial and consumer applications. The Google speech-recognition software in millions of Android phones relies on techniques invented by Canadian scientists.

Innovation

Dojo

"We don't want to turn you into the chief information security officer of your own home. That's why it's designed in a way that it's so simple and it's all reactive."

— Atias

Form and function

Dojo is a cybersecurity system for today's smart home, where everything from appliances to door locks to thermostats connects via Wi-Fi. The gadget and a companion app monitor for hackers and suspicious activity.

Innovators Yossi Atias and Shmulik Bachar

Ages Both 46

Titles Co-founder and chief executive officer, co-founder and chief technology officer, at Dojo-Labs, which has offices in Israel and Silicon Valley.



Plug and play Dojo's dock connects to your home's wireless router. A smartphone app allows you to customize settings, including levels of alerts. Origin The Israeli founders met while working at Internet video company PeerApp. They recruited compatriot Gadi Amit, who designed the original Fitbit, to give Dojo its Zen look.



Creature of habit Dojo doesn't monitor the content of communications, but rather scans for unusual activity such as someone trying to access your baby monitor from the Internet.

Funding Israel's Glilot Capital Partners and three private investors in Silicon Valley supplied \$1.8 million

in seed money.



Color coded The dock cradles a black "pebble" that communicates your home's security status. Glowing green rings indicate all is normal; orange says a threat has been blocked; red is an alert that must be checked through the app.

Next Steps

Dojo will begin shipping in March; the gadget can be preordered through Amazon.com. The starter price of \$99 includes a free year of service, which will thereafter be billed at \$9.99 a month. Atias won't reveal how many orders have been booked, but he says Dojo-Labs is in talks with a big tech company to provide security for its Internet of Things platform. —Dune Lawrence

In 2012, Silicon Valley started scouring Canada for top talent, hiring professors, postgrads, and Ph.D.s, and buying startups linked to them. In June, Twitter bought machinelearning company Whetlab, whose founders include two University of Toronto alumni who worked as postdoctoral researchers with Hinton. "With the pull from U.S. companies, we run the risk of losing our best minds," says Yoshua Bengio, a professor at the University of Montreal and co-director of Cifar's neural network program. "I think it's important that people in the [provincial] governments get together and make it attractive to stay here in Canada." Speaking at a recent AI conference at the University of Toronto, the city's mayor, John Tory, said, "I see it as a big part of my job and indeed the future of this city to do everything possible to make sure they feel they don't have to leave town, in fact, they shouldn't leave town."

Canadian companies and universities are trying to protect what they helped build. A program at the University of Toronto to develop AI startups launched in 2015. Montreal is home to several AI companies; authorities there will provide tax credits and help navigate immigration rules to ease recruitment of foreign students at the University of Montreal. Maluuba, a Waterloo, Ont., startup that makes technology allowing people to have detailed text-based conversations with computers, hopes to establish informal links with an AI lab at the university and is opening a research office in the city. "I was really excited to find out about Maluuba, because it meant I could stay Canadian," says Adam Trischler, a research scientist at the company.

At the AI conference in Toronto in early December, Salakhutdinov, who's leaving for Carnegie Mellon, said a dedicated AI center at a Canadian university could persuade researchers to stay. He noted that Carnegie Mellon's program has more than 100 Ph.D. researchers. "That's a huge powerhouse," he says. —Jack Clark and Gerrit De Vynck

The bottom line Canadian companies and universities are starting programs to encourage AI experts to remain in the country.

Edited by Dimitra Kessenides and Cristina Lindblad Bloomberg.com

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The power-hungry

pot industry 42

2015's winners

and losers 43

Sneaky real estate

Why Overstock.com

frightens Wall Street 41

discounts in

Hong Kong 40

When Does Bargaining Become Fraud?

- ▶ Regulators want to crack down on bond dealers who don't tell the whole truth
- "We've identified billions of dollars of potentially problematic trades"

On a used-car lot, a salesman who bends the truth to close a sale isn't breaking the law. But a bond trader using some of the same sales tricks may end up facing criminal fraud charges. That's what happened to Jesse Litvak—and he's putting up a fight. The former Jefferies & Co. trader was found guilty in March 2014 for lying to buyers about how much he paid for bonds he was selling. That conviction was overturned on Dec. 8. Litvak will be retried and get another chance to argue that bond traders are basically used-car salesmen.

Markets/

Finance

December 28, 2015 - January 10, 2016

The Litvak reversal is another setback for regulators who have been trying to change behavior on Wall Street. Although they've extracted tens of billions of dollars in settlements after probes into sales of mortgage bonds and the setting of interest rates and other benchmarks, regulators have been criticized for failing to prosecute high-level bank executives for wrongdoing that led to the financial crisis that almost sank the global economy.

Earlier this year, Sally Yates, the agency's No. 2 official, ordered policy changes to push prosecutors to bring criminal charges against company executives suspected of financial wrongdoing. Her memo almost admitted that the U.S. Department of Justice had lapsed in its duty to put criminals behind bars. In a September speech, Yates said: "This memo is designed to ensure that all attorneys across the department are consistent in our best

efforts to hold to account the individuals responsible for illegal corporate conduct. It's the only way to truly deter corporate wrongdoing."

The case against Litvak was supposed to be the opening salvo against dishonest conduct among bond traders. The Justice Department and U.S. Securities and Exchange Commission have built more than a dozen other cases using the one against Litvak as a model.

The cases won't be easy victories for the government. Lying doesn't necessarily violate securities law. It's only fraud when that deception is considered important to a buyer. The question becomes: Is it important that the buyer knew how much Litvak paid for bonds he later sold? "The

"The government may not like how these markets work...but it is how they do work"

■ government may not like how these markets work, and it may look bad from the outside looking in, but it is how they do work," says Charles Geisst, a Wall Street historian at Manhattan College in New York.

Unlike the probes into mortgage fraud, the bond-trading investigations started by accident. Acting as a middleman, Litvak allegedly bilked investors of \$2 million from 2009 through 2011 by misrepresenting how much sellers were asking for securities, or what potential buyers were willing to pay, then keeping the difference for Jefferies. He kept a spreadsheet of the prices he paid for the bonds and inadvertently sent it in November 2011 to a money manager at AllianceBernstein. The money manager, realizing he'd been lied to, reported Litvak to the U.S. government.

That mishap kicked off a broader investigation into the market by the SEC, which found that Litvak was far from the only bond trader lying to customers. The probes have stunned Wall Street. Traders are fearful that they could end up in jail for conduct that's widespread in the market. Unlike stocks, the securities Litvak sold don't trade on exchanges, so it's hard to get reliable price information. Without a record of trades to consult, buyers rely on dealers for price quotes and do their own calculations to determine a bond's value.

Throughout his case, Litvak didn't deny he lied to customers, but he didn't think buyers would be harmed because he was selling the bonds at "fully disclosed and agreed-upon fair prices" that stayed below the 4 percent profit limit that Jefferies's policies specified. When the appeals court threw out his conviction, it faulted the lower court for excluding some defense evidence, saying Litvak was denied the chance to show that his actions were in keeping with how Wall Street does business.

Even after the reversal, the U.S. government is pushing ahead with other cases. On Dec. 21 former Royal Bank of Scotland Group bond trader Adam Siegel pleaded guilty to lying to buyers.

The agreement comes with a big caveat: He can withdraw his plea if Litvak is found to have not broken the law.

As the SEC sees it, just because something is common practice on Wall Street doesn't mean it conforms to securities laws. The agency has built its own algorithms to comb through trading data to look for red flags instead of waiting for complaints. The SEC has uncovered brokers charging buyers higher fees, traders hiding their positions, and dealers running deceptive auctions. "We've identified billions of dollars of potentially problematic trades," says Michael Osnato Jr., head of the regulator's Complex Financial Instruments unit. "We have opened promising investigations thus far based on these efforts and expect more to follow soon."

The Litvak ruling will shape how the SEC pursues some of these violations. The intensive monitoring of debt backed by mortgages and other assets represents a first for the agency. Before the credit crisis, the SEC viewed the market participants as sophisticated investors who didn't need close supervision. That assumption came undone when plummeting prices in the debt markets kicked off the crisis. "The government's new interest is reflective of the fact that they've had very little interest in this market historically," says James Cox, a professor at Duke University School of Law. "They just hadn't looked at it." - Matt Robinson

The bottom line The government crackdown on deceptive bond-trading tactics may bog down in court because they're so common.

Real Estate

Hong Kong Builders Veil Their Discounts

- No one wants to kick off a decline in property values
- "Developers are very keen to sell but don't want to cut prices"

Kowloon Development is offering a raft of rebates and hidden discounts that can reduce the cost of an apartment at its Upper East project in Hong Kong's Hung Hom area by as much as 14 percent—and the company will help



provide financing, too. The enticements are paying off. Since its Sept. 5 launch, the project has sold 940 of 1,008 units. One buyer even bought two apartments, one on the sixth floor and one on the eighth, according to transaction data published on the company's website.

Cheung Kong Property Holdings

and Henderson Land Development are among other Hong Kong developers offering inducements including tax rebates and first and second mortgages to keep buyers coming. So far, that's allowed them to avoid the outright price cuts they're concerned could end the steady gains that made the city the world's least affordable major housing market. "Developers are very keen to sell but don't want to cut prices," says Yu Kam-Hung, senior managing director for investment properties at CBRE Group in Hong Kong.

Their efforts may not succeed in holding off a downturn. Investment company Bocom International Holdings sees house prices dropping



as much as 20 percent in the next three to six months, while property adviser Colliers International Group predicts a 15 percent slide next year.

Developers are rushing to sell homes in advance of an expected increase in the housing supply next year. They fear the slowdown in the market for existing homes will spill over into new-home sales. Mainland buyers, who've been stoking demand, have pulled back. Their share of property purchases in Hong Kong fell to 6 percent in the first six months of this year, down from 12 percent at the peak in 2011, according to data from Jones Lang LaSalle.

The last time Hong Kong saw such generous promotions was in 2003, when home prices were at the bottom of a six-year plunge, according to Nicole Wong, head of property research at investment firm CLSA. The decline in property prices at the time forced developers to write down the value of their projects and sell homes at a loss. No developer wants to

raise the prospect of that happening again. "After 12 years of a bull market, Hong Kong property is at an inflection point," says Spencer Leung, a strategist at UBS Group. "Property developers are trying hard not to paint a picture that things are going down."

In the case of Kowloon Development, the rebates on the Upper East project helped reduce the price the buyer paid for the two flats to HK\$6.9 million (\$890,000) from more than HK\$8 million. Across Victoria Harbor, at the upscale Cadogan tower in the Kennedy Town neighborhood on Hong Kong Island, Kowloon Development is offering similar sweeteners. In October, a 732-squarefoot apartment on the 31st floor, listed at HK\$21 million, ended up costing the buyer HK\$18.5 million, with the developer arranging first and second mortgages through its finance subsidiary covering as much as 90 percent of the price.

Supply is expected to increase by 70,000 to 80,000 new units within the

next three to four years, according to CBRE's Yu. "I do feel they're going to cut prices, but they don't want to do it overly aggressively," says Leung, of UBS. "Nobody wants to spoil the party."

—Frederik Balfour and Lisa Pham

The bottom line With supply increasing, analysts see Hong Kong home prices falling as much as 20 percent in coming months.

Investing

Selling Stock in Cyberspace

- Overstock.com explores issuing shares using bitcoin technology
- "We basically have a Wall Streetin-a-box now"

Online retailer **Overstock.com** has a plan to use the technology behind bitcoin to change the way companies dole out shares in initial and secondary offerings. The online discounter moved a step closer to its goal on Dec. 9, when the U.S. Securities and Exchange Commission gave it permission to issue as much as \$500 million in its own stock and other securities in a secondary offering through a digital trading system—which could be less costly than a conventional offering.

Overstock Chief Executive Officer Patrick Byrne says that rules governing stock offerings prevent him from saying much about the company's plans for using the technology. He says, "I'm spending my Christmas break" trying to figure out "if we're going to use this, and how."

The idea, according to an Overstock SEC filing, is to issue shares using blockchain, the software that governs bitcoin transactions. Essentially, blockchain is a public ledger that records all transactions for whatever instrument it supports, be it a cryptocurrency or company stock. Jeremy Allaire, CEO of Circle, a digital currency company, describes blockchain as "a giant trust machine"—a globally shared database that can irrefutably prove ownership of records in the database.

Byrne has embraced bitcoin with gusto, accepting payments at his Web store and speaking frequently on

◀ the topic. "Are we in the business of selling discount toasters, or are we in the business of building higherperformance technology that's matching buying and selling?" he says.

In June, Overstock issued corporate bonds through blockchain—a move that didn't require SEC approval—to test how the system might work. A person who wants to buy or sell shares on Overstock's blockchain system would need to open an online brokerage account to get access to Overstock's digital trading platform, according to its SEC filing. Ownership and trades of the digital securities would be published on the public ledger. Overstock's technology could ultimately be used by other companies to sell shares in initial public offerings or secondary offerings.

"We're taking a crawl, walk, run approach," says Byrne. "The crawl was to introduce a private cryptosecurity that did even one trade. So we did that. The walk would be issuing a public security that's Overstock's public security. That would be the possible next step. Then the third step, the run, would be issuing a public cryptosecurity for someone else."

Even if the mechanics work, there's no guarantee there will be a sufficient supply of blockchain shares—and enough demand for them—to make a market work. "The question still is, can you get a critical mass of investors?" says Michael Casey, senior adviser on blockchain at MIT Media Lab. "A market is only as good as the number of participants in it."

Blockchain shares would pose a challenge to the banks and securities firms

that earn fees for handling conventional stock offerings. Byrne says that after he announced Overstock had received the SEC's permission, "I had small companies approaching me, saying, 'We're near an IPO, and can we do it on your system?'" he says. "We basically have a Wall Streetin-a-box now—a crypto-Wall Street."

At the same time, Wall Street banks, exchanges, and startups are exploring how blockchain software and digital ledgers could be used to process financial transactions more quickly and cheaply than current methods. **Nasdaq**

Byrne

OMX Group announced earlier this year that it's testing blockchain technology for trading among privately held companies. "This is the first glimpse of the future of equity trading," says Campbell Harvey, a professor of finance at Duke University, who teaches a class on bitcoin and blockchain. "It's showing how vulnerable the traditional methods of equity trading potentially are, and how easy it will be to disrupt the status quo." —Selina Wang

The bottom line Overstock.com has won SEC permission to sell as much as \$500 million in stock using the technology behind bitcoin.

Energy

Attention, Pot Smokers: Weed Is Not Green

- Grow operations consume vast amounts of power
- ► "Cannabis use could cancel out" your "low-carbon footprint"

At a Denver warehouse, growers wear sunglasses as they check on 150 topheavy flowering plants. The 4-foot-tall bushes are flourishing under dozens of blazing 1,000-watt bulbs. "All these things consume too much power," says Paul Isenbergh, a commercial real estate broker and co-owner of the 3,100-square-foot medical marijuana operation called Sense of Healing. He gestures at equipment surrounding varieties with names like Grape Crush.

"The air conditioning, the lighting, the fans, the scrubber, the humidifier."

The \$3.5 billion U.S. cannabis market is emerging as one of the nation's most power-hungry industries, with the 24-hour demands of thousands of indoor growing sites taxing aging electricity grids and unraveling hard-earned gains in energy con-

servation. Without design standards or efficient equipment, the facilities in the 23 states where marijuana is legal are responsible for greenhouse gas emissions almost equal to those of every car, home, and business in New Hampshire. "Consumers seeking

a green lifestyle are likely unaware that their cannabis use could cancel out their otherwise low-carbon footprint," Evan Mills,

a senior scientist at California's Lawrence Berkeley National Laboratory, wrote in an e-mail.

'We had roughly a 30 percent increase in electricity use in five years."

—Michael Winkler, mayor of Arcata, Calif.

Some operations have blown out transformers, resulting in fires. Others rely on pollution-belching diesel generators to avoid hooking into the electric power grid. And demand could intensify in 2017 if advocates succeed in legalizing the drug for recreational use in several states, including California and Nevada. State regulators are grappling with how to address the growth, says Pennsylvania Public Utility Commissioner Pam Witmer. "We are at the edge of this," Witmer says. "We are looking all across the country for examples and best practices."

Indoor pot-growing operations in 2012 racked up at least \$6 billion in energy costs, compared with \$1 billion for U.S. pharmaceutical companies, Mills found in a study he did independent of Lawrence Berkeley. Published in 2012, before the industry exploded following legalization in almost half the states and the District of Columbia, his report remains the best gauge of power use in the pot industry.

Some larger facilities consume as much as \$1 million in power a month. In Colorado, more than 1,200 licensed grow facilities are responsible for almost half of total new demand for power. In 2014, two years after residents voted overwhelmingly to legalize the drug for recreational use, growing sites consumed as much power as 35,000 households. In California, the nation's oldest legal medical pot market, indoor production consumed 9 percent of household power, the amount used in 1 million homes, Mills found.

At indoor operations such as Sense of Healing, the atmosphere is calibrated to allow growers to reap multiple harvests a year. The intense heat from the lights requires air conditioning and fans to keep grow rooms at 75F, a dehumidifier to prevent mold, and a carbon dioxide injection system. The electric bill for all this: as high as \$5,000 a month. That represents

as much as 50 percent of an operator's overhead, yet profits far outweigh costs, with a pound of medical marijuana fetching about \$2,500 on the wholesale market, Isenbergh says. His costs to grow it are only \$600 a pound.

Some cities where growing operations are legal have seen power consumption soar even as communities nearby made gains in meeting conservation goals. The disparity prompted several municipalities to tax growers who strain the grid. In Arcata, Calif., the local government is taking in \$300,000 a year from an "excessive energy use tax" that went into effect in October 2013. Voters approved the levy in 2012 after police and fire departments spent as much as 20 percent of their time responding to calls at growing operations.

The city council placed the measure on the ballot after Pacific Gas & Electric found that 10 percent, or 663, of Arcata's households were being used for large-scale marijuana cultivation. Many were receiving subsidized electricity rates based on low reported income, Mayor Michael Winkler says. "Instead of having our electricity use going down, we had roughly a 30 percent increase in electricity use in five years prior to the tax," Winkler says. The tax caused the number of large home-grow operations to fall 90 percent, he says.

In Boulder County, Colo., commissioners levied an energy usage fee on pot facilities after discovering that a 5,000-square-foot operation consumed 29,000 kilowatt-hours a month, about five times more than a typical commercial customer, says Ron Flax, the county's sustainability examiner. Such operations send about 30,334 pounds of carbon dioxide per month to the atmosphere, county statistics show. The fee will be used in part to pay advisers to help growers become more efficient. It will go into full effect next year. "We were aware there would be an increase in the carbon footprint because of this industry," Flax says. "We are trying to get out ahead of it." -Jennifer Oldham

The bottom line In Colorado, more than 1,200 licensed indoor pot-growing sites consume as much power as 35,000 households.

Bloomberg.com

Scorecard 2015

By Laurie Meisler and Jennifer Prince

Top S&P 500 stock

+139%

Shares of **Netflix** soared on strong subscriber growth, helped by original programming. The service has launched in most major European markets, Japan, and Australia. It has 26 million foreign subscribers and aims to have more than 100 million by 2020. It expects to have 74 million total subscribers by the end of 2015.

Biggest gain in wealth

+29.7b

The fortune of Amazon.com founder **Jeff Bezos** doubled to \$58 billion on the strength of the 114 percent rise in his company's stock, making him the biggest winner among the world's richest people. Warren Buffett's worth declined by \$12.3 billion, to \$61.5 billion, as stock in his Berkshire Hathaway fell 12.9 percent.

Hottest commodity

+14.1%

Cocoa was one of only two commodities to post positive returns. The other was palm oil. The rest fell victim to slow global growth and shrinking demand. Oil fell 40.8 percent on the Nymex, while gold declined 8.9 percent, to \$1,078 an ounce.

Data as of Dec. 21, 2015, compiled by Bloomberg

Global Megadeals

57

Allergan and Pfizer's \$183.7 billion merger help set the record for number of deals worth \$10 billion or more. There were 37,240 corporate combos worth a record \$3.8 trillion.

Global IPOs

266

China led the world in number of initial public offerings; the U.S. was second at 203. The best performer among the 20 largest IPOs was China National Nuclear Power, up 194.4 percent from its June 10 offering.

U.S. IPOs

\$29.4b

The value of U.S. IPOs fell 41 percent from 2014's \$50.4 billion. The 20 largest offerings averaged a return of less than 8 percent. **GoDaddy**'s 69.9 percent gain led the pack.

Global Stocks

-1.7%

The MSCI World Index fell slightly, with energy dropping the most, down 24.2 percent, while health care led the gainers, climbing 5.5 percent.

Global Markets

+42.8%

The **Budapest** exchange won the world cup for stocks, with Copenhagen finishing second, up 36.8 percent. Colombian stocks fell 25.6 percent, the most among 44 world markets.

U.S. Bankruptcies

74

Chapter 11 filings involving debt of \$100 million or more reached the highest level since 2010. While the energy industry accounted for 25 of the filings, the biggest was Caesars Entertainment, which listed liabilities of \$19.8 billion.

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CHIPOTLE'S CRISIS

By Susan Berfield

Photographs by Ted Cavanaugh





hris Collins is a 32-year-old Web developer and photographer who lives in Oregon, just outside Portland. He and his wife are conscientious about their food: They eat organic, local produce and ethically raised animals. Collins liked to have a meal at Chipotle once a week. On Friday evening, Oct. 23, he ordered his regular chicken bowl at his usual Chipotle in Lake Oswego.

His dinner was made of 21 ingredients, including toasted cumin, sautéed garlic, fresh organic cilantro, finely diced tomatoes, two kinds of onion, romaine lettuce, and kosher salt. It tasted as good as always.

By the next night, Collins's body was aching and his stomach was upset. Then he began experiencing cramping and diarrhea. His stomach bloated. "Moving gave me excruciating pain," he says, "and anytime I ate or drank it got worse." His diarrhea turned bloody. "All I was doing was pooping blood. It was incredibly scary." After five days, he went to an urgent-care clinic near his home; the nurse sent him to an emergency room. He feared he might have colon cancer.

On Halloween, the ER doctor called him at home: Collins had Shiga-toxin-producing E. coli 026, and he'd likely gotten it from one of those 21 ingredients in his meal at Chipotle. (This was later confirmed by public-health officials.) The doctor warned him that kidney failure was possible; intensive treatment, including dialysis, could be necessary. His kidneys held up, but it took an additional five days for the worst of Collins's symptoms to ease and nearly six weeks for him to recover. He still doesn't have as much physical strength as he used to, and he feels emotionally shaky, too. "Before, I was doing the P90X workouts. For a long time after, I couldn't even walk a few blocks," he says. "It made me feel old and weak and anxious." On Nov. 6, Collins sued Chipotle, seeking unspecified damages.

Collins was among 53 people in nine states who were sickened with the same strain of E. coli; 46 had eaten at Chipotle in the week before they fell ill. Twenty got sick enough to be hospitalized, according to the Centers for Disease Control and Prevention. "I trusted they were providing me with food with integrity," Collins says, sarcastically repeating the company motto. "We fell for their branding." Chipotle's public stance during the outbreak irritated him, too. The company closed all 43 of its restaurants in Oregon and Washington in early November to try to identify the source of the E. coli and sanitize the spaces. Notices on restaurant doors generally referred to problems with the supply chain or equipment. But local media reported that at least one restaurant in Portland put up a note that said, "Don't panic... order should be restored to the universe in the very near future." "That felt so snarky," Collins says. "People could die from this, and they were so smug."

For a long time, smug worked pretty well for Chipotle Mexican Grill. It's grown into a chain of more than 1,900 locations, thanks in part to marketing—including short animated films about the evils of industrial agriculture—that reminds customers that its fresh ingredients and naturally raised meat are better than rivals' and better for the world. The implication: If you eat Chipotle, you're doing the right thing, and maybe you're better, too. It helped the company, charging about \$7 for a burrito, reach a market valuation of nearly \$24 billion. Its executives seemed to have done the impossible and made a national fast-food chain feel healthy.

Fewer people associate Chipotle with "healthy" now. Three months before Collins was infected with E. coli, five people fell

ill eating at a Seattle-area restaurant. By the time local health officials had confirmed a link, the outbreak was over, so no one said anything. In August, 234 customers and employees contracted norovirus at a Chipotle in Simi Valley, Calif., where another worker was infected. Salmonella-tainted tomatoes at 22 outlets in Minnesota sickened 64 people in August and September; nine had to be hospitalized. Norovirus struck again in late November: More than 140 Boston College students picked up the highly contagious virus from a nearby Chipotle, including half of the men's basketball team. An additional 16 students and three health-care staff picked it up from the victims. The source? A sick worker who wasn't sent home although Chipotle began offering paid sick leave in June. In the second week of December, when Chipotle should have been on highest alert, a Seattle restaurant had to be briefly shut down after a health inspection found that cooked meat on the takeout line wasn't being kept at a high enough temperature. And in the most recent case, on Dec. 21, the CDC announced it was investigating an outbreak of what seems to be a different and rare version of E. coli 026 that's sickened five people in two states who ate at Chipotle in mid-November. The company says it had expected to see additional cases. It still doesn't know which ingredients made people ill.

Almost 500 people around the country have become sick from Chipotle food since July, according to public-health officials. And those are just the ones who went to a doctor, gave a stool sample, and were properly diagnosed. Food-safety experts say they believe with any outbreak the total number of people affected is at least 10 times the reported number. The CDC estimates that 48 million Americans get sick from contaminated food every year.

At Chipotle, three different pathogens caused the five known outbreaks. That wasn't inevitable or coincidental. "There's a problem within the company," says Michael Doyle, the director of the center for food safety at the University of Georgia. Chipotle has gotten big selling food that's unprocessed, free of antibiotics and GMOs, sometimes organic, sometimes local. "Blah, blah," says Doug Powell, a retired food-safety professor and the publisher of barfblog.com. "They were paying attention to all that stuff, but they weren't paying attention to microbial safety." Whatever its provenance, if food is contaminated it can still make us sick—or even kill. Millennials may discriminate when they eat, but bacteria are agnostic.

"Food with integrity," a promise to Chipotle's customers and a rebuke to its competitors, has become the source of much schadenfreude among both. Chipotle's stock has lost about 30 percent of its value since August. Sales at established stores dropped 16 percent in November, and executives expect a decline of 8 percent to 11 percent in comparable-store sales for the last three months of the year. That would be the first quarterly decline for Chipotle as a public company.

Steve Ells, Chipotle's founder and co-chief executive, went on the *Today* show on Dec. 10, apologized to everyone who'd fallen ill, and announced a comprehensive food-safety program that he said would far exceed industry norms. He didn't address why a company that had challenged quality standards with such gusto hadn't taken on safety standards as well. Chipotle has said





it will shift more food preparation out of restaurants and into centralized kitchens—that is, it will do things more like the fastfood chains it's long mocked. Ells's company has always urged customers to think about its supply chain. Well, now they are.

Six weeks after the first E. coli victims in the Pacific

Northwest got sick and about a week after Ells's *Today* appearance, Chipotle placed a full-page ad, signed by him, in newspapers across the country. "The fact that anyone has become ill eating at Chipotle is completely unacceptable to me, and I am deeply sorry," he wrote. "As a result, we are committed to becoming known as the leader in food safety, just as we are known for using the very best ingredients in a fast-food setting." Ells was in Seattle by then. During interviews he carefully followed the new standard thinking on corporate crisis management: Overapologize and then pivot to the cheery future.

On Dec. 17, speaking by phone in New York, he's still on message, describing the Seattle restaurants he visited as clean and organized. "I ate delicious food there," he says. "Traffic was slow, but we're ready for people to come back. There is no E. coli in Chipotle." To hear Ells tell it, the company is witnessing an outbreak of excitement. He says the chain's suppliers are excited to participate in the new safety programs; employees at head-quarters in Denver are excited to contribute however they can;

it's "a very, very exciting time for us to be pushing the boundaries" on food safety. "We're embracing this as an opportunity."

Ells studied art history in college, trained as a chef at the Culinary Institute of America, and opened the first Chipotle in Denver in 1993 with a loan from his father. He set up a model—open kitchen, fresh ingredients, real cooking in the back, and an assembly line in front, allowing customization and speed—that's become its own industry standard. Chipotle grew from 489 restaurants and revenue of \$628 million in 2006, when it went public, to about 1,800 restaurants and \$4.1 billion in revenue in 2014. Net profit increased 60 percent from 2012 to 2014. Ells and his co-CEO, Montgomery Moran, together earned more than \$140 million in total compensation during that time. And Michael Pollan, the good-food arbiter, said that Chipotle was his favorite fast-food chain and that he didn't have a second.

The company was influenced in ways it doesn't always admit by the biggest, most industrialized chain of them all: McDonald's. The company invested about \$340 million in Chipotle from 1998, when it had 13 restaurants in Colorado, until 2006, when the two parted ways. McDonald's taught Chipotle supply-chain economics. Chipotle often derides fast-food chains and their factory farms, enlisting the likes of Willie Nelson to make plaintive music videos about crop chemicals and steroidal cattle. But Ells respects McDonald's size. In an interview with Bloomberg in 2014, he said Chipotle could one day be "bigger than McDonald's in the U.S. I mean, that's not an unreasonable way to think about this."

The companies shared distribution centers and processing facilities, and in some cases they still do. Chipotle calls these facilities commissaries. They'll play an increasingly important role as more food prep is shifted to these centralized kitchens. When I ask who else uses them, Ells, leery of invoking the competition, says: "I don't know if I know their other customers. I can see what you could make of this. It's nothing."

Chipotle, like any chain its size, has infrastructure it doesn't always want to fully reveal. McDonald's has a System. Chipotle does, too. It has about 100 suppliers for its 64 ingredients. That doesn't include local farms—those within 350 miles of a restaurant—which at peak season supply only 10 percent of its produce.

Executives will identify a few suppliers: Chipotle has for 15 years bought pork for its carnitas from Niman Ranch, where pigs are raised outdoors or in pens that are "deeply bedded." The company website features Tom Kearns, a Wisconsin dairy farmer, as a symbol of its support for family farms. But most suppliers go unnamed. Why? "This is not something we generally provide," Chipotle spokesman Chris Arnold said in an e-mail.

Nor does Chipotle generally provide the names of its distributors or commissaries. But it will confirm them if asked. Chipotle's pork and beef are braised at OSI Group and Ed Miniat Inc., outside Chicago; Ready Foods in Denver cooks its beans and makes its red and green salsas. The companies don't talk about their other clients, but on its website, OSI calls itself "a global leader in supplying value-added protein items" and other foods to large brands. John Knight, a restaurant consultant who worked with Chipotle from 2009 to 2011, describes these commissaries as high-end. "Chipotle uses the ones that do food for

ALS DISCRIMINATE; A ARE AGNOSTIC

THAT'S A KILL S

cruise ships and casinos," he says. "They're not making hospital, school, or jail food." Ells, ever wary of protecting Chipotle's image, notes that he taught the chefs in these commissaries to cook food the way he would.

The source, or sources, of E. coli were somewhere in that supply chain. Because restaurants from Oregon to New York served contaminated food, the problem most likely originated with one of Chipotle's big suppliers, not one of the local farms. E. coli is spread through human and animal feces. The harmful microbes can be transmitted to crops in irrigation water, or if animals are allowed to defecate in the fields, or if manure isn't properly treated. Cooking food long enough at high enough temperatures or properly sanitizing it kills E. coli. Hard-to-clean produce that's eaten raw is considered high-risk. At Chipotle that's the tomatoes, lettuce, and cilantro—in other words, the same stuff that gives Chipotle its fresh-tasting advantage.

The CDC says Chipotle has been very cooperative in the E. coli investigation, but that the company is having trouble telling the agency which batches of ingredients went to which stores at which times. "The system they have is not able to solve the problem we have at hand. It's not granular enough," says Ian Williams, chief of the CDC's outbreak response and prevention branch. He notes that "traceability from the farm to the point of service" should be improved throughout the food industry. In recent years, the agency has been able to find the contaminated ingredients in fewer than half of all multistate outbreaks. Without a conclusion to the investigation, some customers' unease about returning to Chipotle could be prolonged. Ells prefers to see the uncertainty as another opportunity. "The silver lining is that it has forced us-not forced us, caused usto take a rigorous look at every ingredient." Couldn't Chipotle have done that anyway? "Yes, that's true."

The spread of norovirus in Simi Valley and Boston was caused by breaches of protocol, Ells says. Those protocols were established at Chipotle in 2008 after a norovirus outbreak sickened

ARE YOU SURE YOU WASHED THAT?

1985

Listeria linked to Mexican-style soft cheese kills 52. Some reports put the number higher. It's one of the deadliest outbreaks in the U.S.

500 people near Kent State University, in Ohio. Norovirus, which is highly contagious, is the leading cause of illness from contaminated foods, affecting as many as 21 million people in the U.S. every year. Its symptoms, including diarrhea, vomiting, and stomach pain, usually last a couple of days. It's a problem on cruise ships and in other enclosed places; in Britain it's known as the winter vomiting bug. The Boston College outbreak occurred as students were preparing for finals. Health services helped care for the sick students, and the dining hall staff prepared special meal packs for them. The facilities crews disinfected every common area on campus.

In late October, Chipotle hired Mansour Samadpour, head of IEH Laboratories & Consulting Group in Seattle, to put together a more aggressive food-safety plan, which they hope will bring the risk of contamination to near zero. Samadpour describes his lab as a privately financed public-health organization. "Being in

compliance with industry standards is less than 5 percent of what companies need to do to make food safe," he says. "Company after company finds that out after they have events."

Samadpour recommended changes at every step of Chipotle's system. More food will be prepared ahead of time, out of sight at commissaries, and transported to 19 distribution centers and then to more than 1,900 restaurants. Samadpour calls it an "industrial-strength plan," a term Ells and other executives use, too. This won't turn Chipotle into McDonald's, but it could make for some awkward marketing. "They're sort of in a bind," says Christopher Muller, a professor of hospitality at Boston University. "They want to have this local, fresh image, and making food in a commissary and shipping it all over the country takes away from that."

Before it's harvested, produce will be screened for pathogens in small batches using what Chipotle calls high-resolution DNA-based tests. Meeting these higher standards will be expensive for smaller farms: There's the cost of the testing itself and of discarding rejected vegetables and herbs. "Will everybody be able to afford it right away? No," Ells says. "Will we help? We will. Is it going to work everywhere? Maybe not." Chipotle's chief financial officer, Jack Hartung, is more direct. "We like the local program, we think it's important, but with what's just happened we have to make sure food safety is absolutely our highest priority," he says. "If it's testing and safety vs. taking a step backward on local, we would do that and hope it would be temporary."

If produce passes the initial tests, it will be sent to the commissaries, where it will be washed, sanitized, and retested. The commissaries, rather than the restaurants, will be responsible for cleaning and packaging the cilantro, shredding the lettuce, and dicing the tomatoes.

A single Chipotle restaurant uses about five cases of tomatoes a day. Employees used to dice the tomatoes by hand in the restaurants. When that became too demanding a task,

1993

E. coli in Jack in the Box fast-food burgers kills four children. Hundreds are sickened along the West Coast.

1996

Odwalla-brand raw apple juice containing E. coli sickens at least 65 in the U.S. and Canada. The company is found criminally liable and agrees to pay a \$1.5 million fine.

1998-99

Listeriacontaminated frankfurters and deli meats sicken more than 100 and kill 14 across the U.S. There are also four miscarriages or stillbirths.

Ells introduced food processors, but he wasn't happy with the results. He moved the dicing to a centralized kitchen. He won't say where. Two years ago, Chipotle bought food processors that could dice tomatoes in its kitchens just as well as the commissaries could and better retain their flavor. But now, post-E. coli, the tomatoes will again arrive at the restaurants diced, packaged, and tested for pathogens. "If you ate the tomato on its own, could you tell the difference? Maybe," Ells says. "But I challenge you to tell the difference in a burrito." Ells says the tomatoes themselves will be the same, but the cuts will be cleaner and more consistent. Still, he says, "it is my desire that one day we can do it in-house again. There's no method of testing that makes that possible now."

Commissaries have been preparing a portion of Chipotle's meat from the early days. It was never practical or efficient to braise meat in Chipotle's small kitchens. The barbacoa



and carnitas are vacuum-packed and cooked sous vide, in a temperature-regulated bath. Then they're sent to regional distribution centers and on to the restaurants. Steak and chicken arrive raw in the restaurants and are marinated in an adobe rub, then grilled. The new protocols require changes to how the meat is marinated to prevent cross-contamination.

In the restaurants, workers will add cilantro to highertemperature rice. "That's a kill step," Samadpour says. They'll blanch avocados, onions, jalapeños, lemons, and limes for 5 to 10 seconds in boiling water. That will destroy any microbes on the surface. Lemon and lime juice will be added earlier to the salsa and guacamole to reduce the microbe count. "And guess what?" Ells asks. "It turns the salsa a brighter red and gives a sweeter taste." Any suggestion that these tweaks might together cause a noticeable change in taste for the worse is dismissed. "It's the genius of 'and," Ells says. "We're doing both: great ingredients and the safest place." Hartung, the CFO, has his own way of conveying that idea: "We want to have our cake and eat it, too."

The Chipotle assembly line is a marvel of

efficiency, and Ells often speaks of it in a way that would make a McDonald's executive proud. "We all think about the Chipotle line. ... How do you do it faster?" he said in his 2014 interview with Bloomberg. "Throughput is something that we always will have to think about. Faster, faster, faster, faster." Throughput is the unappetizing way fast-food restaurants talk about serving their customers when their customers aren't listening. On the most efficient Chipotle lines, customers get their food in less than two minutes, says Knight, the restaurant consultant. Most other fast-casual chains take from four to six minutes. Arnold, Chipotle's spokesman, says fast locations "process more than 300 transactions per hour during peak hours."

An alarm goes off every hour in every Chipotle restau-

Day on Sept. 9. The goal was to hire 4,000 employees, increasing its staff by 7 percent. That sounds like a public-relations coup and a human resources nightmare. Were some of Chipotle's safety problems a result of growing too fast? "I can understand linking the two, but I don't think the growth rate is the cause of the problem," Hartung says. "The standard procedures worked for a long time. We hadn't had outbreaks since 2009. We're not going back and saying let's train them to do better. We're training them to do something different."

No one at Chipotle has publicly estimated the cost of the safety programs it's putting in place. "Very, very expensive," is as close as Ells comes. "Right now we're not trying to make this cost-effective. We're just doing it," Hartung says. "We're likely to do it very inefficiently." When asked at an investor conference if he'd consider raising prices or decreasing portions to cover some of the expense, he said: "That would be tacky." He did note, though, that eventually Chipotle might raise prices, and "instead of investing that in food integrity, we might have to

invest that in food safety." In the meantime, he says profits and the profit margin will be messy. The company is

> also facing at least seven lawsuits, the most recent filed by a mother whose son was infected with norovirus in Boston. He's still recovering. Chipotle says it doesn't comment on pending legal actions, but in incidents such as these its aim is to make things right with customers.

Chipotle isn't giving any estimates for 2016 at all, except to say that 220 to 235 restaurant openings will proceed. When I ask Ells if they've considered scaling back, he says: "Not at all. It never entered our minds."

Chipotle was already experiencing slower growth in established stores. Comparable-store sales rose 16.8 percent in 2014; during the first nine months of 2015, that figure was 5.5 percent. Hartung says there have been surges and slowdowns before. "Nothing signaled to us that we were at a peak," he says. "We were just taking a pause." Yet it's natural for a company that's been around for two decades to shift to more modest growth.

It's worth noting that, contaminated food aside, Chipotle is

2000

At two Sizzler restaurants in Milwaukee, raw meat that came into contact with other food results in an E. coli outbreak. One girl dies; 65 other people become ill.

2002

Listeria in Pilgrim's Pride chicken kills seven people and results in the largest recall in the history of the U.S. Department of Agriculture.

2003

Green onions at a Chi-Chi's restaurant are the culprit when 650 people contract hepatitis A. Four people die.

2006

About 200 fall ill and three die from E. coli associated with raw spinach packaged by Natural Selection Foods.

2008-09

Nine people die from eating salmonella-tainted food from Peanut Corp. The outbreak hits 46 states. More than 800 products are recalled.

2014-15

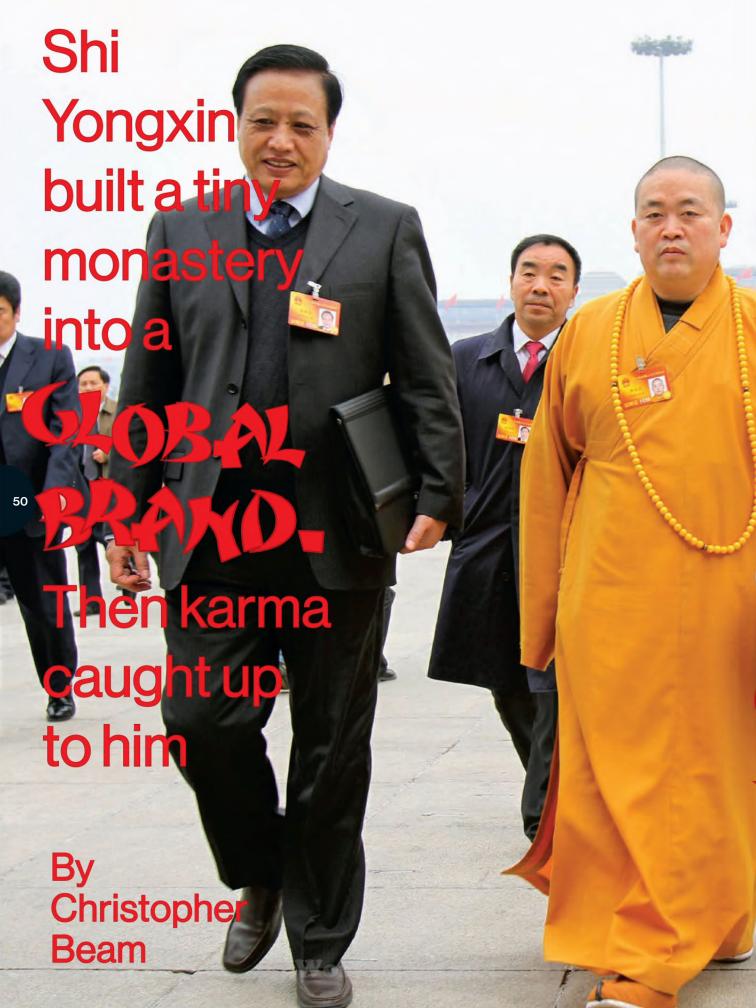
Listeria-laced caramel apples kill seven and sicken 35 in 12 states.

rant, to remind workers to wash their hands and put on new latex gloves. But three former managers, who asked to remain anonymous to speak openly about their former employer, said the alarm was often ignored when the restaurants were busy. Field managers came by every month or so, and for a few days afterward employees observed the hand-washing rule, says a former manager, who worked in a restaurant outside San Francisco. Then they'd slack off again. He also notes that Chipotle put more emphasis on the safe handling of meat than produce. Another former manager, from Arizona, says Chipotle assumed the speed and skill of seasoned culinary workers, while her restaurant was staffed mostly by young employees on their first job. Arnold says new employees aren't expected to work as efficiently as more experienced ones.

Chipotle opened 192 restaurants in 2014 and expected to open 215 to 225 in 2015. The company held its first National Career on the right side of fresh food trends, while its more old-school rivals stumble. But the company's pause could be extended. Mark Crumpacker, the chief creative and development officer, says Chipotle has seen a drop-off among its least frequent customers and its most frequent. "That's more worrying," he says. Chipotle may have lost some customers altogether. "A small percentage may never come back, or it may take years."

Confidence has taken the company far. It may have gotten Chipotle into this mess; it may help get it out. Crumpacker says he has plans for advertising next year on radio, in print, online, and through direct mail. "It won't be, 'Come to the safest place to eat," he says. "Hopefully, it will be humorous to the extent that's appropriate." But he knows how great the challenge is. "There's nothing worse from a trust perspective. This is not the kind of problem that you market your way out of." 3

—With Craig Giammona and Leslie Patton





is Holiness the Venerable Abbot Shi Yongxin would deliver the money himself. Five thousand miles from the Shaolin Temple, the ancient Buddhist monastery and wellspring of kung fu that he oversees in the mountains of central China, a city council in Australia had approved his purchase of some land. Attuned to the power of symbolic gestures, Yongxin wanted to seal the deal in person, so in February the cherubic, saffron-robed abbot journeyed from Henan province to Shoalhaven, New South Wales, and handed the mayor a check for \$3 million. Yongxin smiled and pressed his hands together, as if in prayer. "It is destiny," he said.

Yongxin had negotiated for the property for nearly a decade. He wanted to build a complex there called Shaolin Village, where Australians and international tourists could learn about Chan Buddhism and the temple's famed warrior monks. But to think of Shaolin Village as a temple would be like calling Versailles a house. In addition to a monastery and kung fu academy, the development Yongxin envisioned included a four-star hotel with 500 beds, residential villas, and a 27-hole golf course, at a cost of more than \$270 million.

Yongxin, in his 16 years as head of the Shaolin Temple, had presided over many business ventures and was known across China and the world as the "CEO monk." Since taking his vows of piety in the early 1980s, he had transformed the Shaolin Temple-a picturesque compound of prayer halls, tree-dabbled courtyards, and Buddhist shrines set against a lush mountainside-from a poor and relatively unknown outpost into a global brand. He became a symbol of the successful intersection of church, state, and commerce in China, a kind of anti-Dalai Lama who enjoys political favor as well as spiritual status.

Yongxin first drew national attention in China in the mid-1990s, when he filed a lawsuit against a company that produced Shaolin brand sausages-a product that was not only unauthorized but also, given the Buddhist monks' vegetarianism, particularly off-message. To prevent further brand dilution, he created the Henan Shaolin Temple Industrial Development Co. and registered the name Shaolin as a trademark. While abbots had traditionally overseen only the temple grounds, Yongxin got the shabby warren of shops and martial arts schools outside the complex demolished, in the name of preserving its character, and

PREVIOUS SPREAD; CHINAFOTOPRESS/GETTY IMAGES; THIS SPREAD; CLOCKWISE FROM LEF AFP/GETTY IMAGES; CARL COURT/GETTY IMAGES; CHINAFOTOPRESS/GETTY IMAGES

he clashed with the local government over ticket sales to the region. He also created the Shaolin Kungfu Monk Corps, a touring troupe that performs for paying audiences from Thailand to Canada.

For centuries, the monks of the Shaolin Temple mostly prayed and practiced martial arts, while living off the land and the donations of worshippers. Under Yongxin, their activities expanded to include food and medicine sales, construction, entertainment, and consulting. In 2006 the temple teamed with a Shenzhen media company to produce Kungfu Star, an American Idol-style TV competition. Shaolin announced last year that it would begin developing mobile apps, including instructional kung fu software. The Shaolin Village project in Australia was only the next logical step in the abbot's expansionist theo-corporate empire. "If China can import Disney resorts," he said in March, "why can't other countries import the Shaolin Monastery?"

Yongxin had a knack for politics as well as business. He was both vice chairman of the Buddhist Association of China and a member of the National People's Congress, the country's legislature. He met with luminaries, including Nelson Mandela, the queen of England, and Tim Cook, the head of Apple. Within the temple, he commanded a loyal following among its 400 or so monks. "He's the person I respect the most," said Shi Yanlu, one of Yongxin's most trusted disciples, at one point. "He really dares to dream."

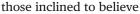
Then, on July 25, a message about Yongxin appeared on a Chinese Internet forum. Its authors claimed to be Shaolin disciples and used the pseudonym Shi Zhengyi. *Shi* is a title taken by all Shaolin monks, and *zhengyi* means "justice" in Mandarin. Borrowing the language of President Xi Jinping's ongoing anticorruption campaign, which promises to target both "tigers" (high-level officials) and "flies" (low-level ones), the post asked, "Who will supervise the big tiger Shi Yongxin?" To "protect the hall of our ancestors" and "revitalize Shaolin," the self-proclaimed whistle-blowers were "bravely stepping forward to reveal the rule-breaking and lawbreaking of Shaolin Temple Abbot Shi Yongxin." His misdeeds, they charged, included raping a nun, fathering two children, embezzling funds, and generally "staining the reputation of the Shaolin Temple." The accusers posted photos of a nun and a small child who were supposedly Yongxin's mistress and daughter.

Over the next few days, Zhengyi

released new material. Side-by-side photos seemed to show that Yongxin had not one but two housing registrations, which is illegal in China. A police report included handwritten notes from the interroga tion of a Shenzhen businesswoman who claimed she'd slept with Yongxin and had been threatened by his disciples: one of them "told me he'd let me have a comfortable death," she told the police. A social media user, posting under the same woman's name, uploaded a photo of dirty underwear supposedly worn during a sexual encounter with Yongxin and claimed to have saved a condom used by the abbot. Letters bearing the offi-

Kung fu students practicing in Shaolin

cial stamps of former Shaolin abbots said that Yongxin had been expelled from the temple—twice. The documents' authenticity wasn't confirmed, but



the charges saw in Yongxin a classic portrait: the outwardly pious religious leader exposed as a hypocrite, abusing his authority to commit sins of the flesh and the purse.

Yongxin made a show of proceeding with business as usual. On its website, the temple dismissed the charges as "vicious slander" and called for the government to investigate and prosecute the accusers. Yongxin taunted them in an interview with *Global Times*, a Chinese newspaper, published on Aug. 3. "If I really had a problem, you wouldn't have to post accusations about me on the Internet,"

he said. "You could go directly to the relevant departments."

He might have regretted the challenge. That week, six Shaolin disciples traveled north to Beijing and, on Aug. 8, walked into the Supreme People's Procuratorate, the

central government agency that handles investigations. The group included a former head of the Monk Corps, several other senior monks, and, leading them, Yongxin's trusted disciple, Shi Yanlu. Within a week, government investigators were visiting the Shaolin Temple and scrutinizing the Yongxin empire.

he Shaolin Temple was founded in 495 A.D. by the monk Buddhabhadra, who had traveled from India to China. It's considered the birthplace of Chan Buddhism, a precursor of Zen Buddhism. At the foot of Mt. Song, the temple became known for its warrior monks—a contradiction, given their commitment to nonviolence, but an advantage during wartime—when, in the year 621, a group of Shaolin monks came to the aid of the Tang emperor in battle. The temple thrived during the Ming dynasty, as government officials recruited its monks for 16th century military campaigns, including several battles against Japanese pirates. One account describes a group of 120 monks killing more than 100 "dwarf pirates," while suffering only four casualties.

The Shaolin fared worse under the Qing (1644-1911), as the new rulers, questioning the monks' loyalty, tried to curb their military activ-

ity. In 1928 the temple was torched by a Nationalist general. The rise of Mao Zedong and the Communist Party caused damage first spiritual—monks were forbidden to wear robes or practice Buddhist rituals—and

then physical, when the

Red Guards destroyed

many of the temple's relics during the Cultural Revolution.

A 16-year-old named Liu Yingcheng arrived in 1981. Growing up on a farm in Anhui province, he'd often heard tories about Buddhist monks, and was taken with the idea of, in his words, "living a carefree life, coming and going like the clouds and the fog." Liu's parents opposed him becoming a monk, so he waited until they were traveling to take some money and sneak away to Shaolin. He found the place in a shambles. The temple was falling apart, and only two dozen monks lived there, eating little but maize paste and steamed buns. There hadn't been an official abbot for more than 300 years. Still, Liu sought out the acting abbot, an old man named Xingzheng, who agreed to take him on. Liu cooked and grazed cattle while beginning his studies. He was an unremarkable martial artist, but he was smart, and Xingzheng took a liking to him. During the young man's vow ceremony, the abbot gave him the dharma name Yongxin.

Any sense of tranquility was about to end. In 1982 the film *The Shaolin Temple*, shot on location and starring a 19-year-old kung fu phenom named Jet Li, became one of the first Chinese-made international blockbusters. Inspired by the story of a slave boy fleeing to Shaolin to learn kung fu and avenge his father's death, would-be monks made pilgrimages to the temple and offered to join

its ranks. Children flocked from around the country to study martial arts, and dozens of training schools opened. Tourism spiked from roughly 50,000 visitors per year in the late 1970s to 2.6 million in 1984.

Yongxin watched this explosion with some trepidation, but mostly excitement—it was an opportunity to spread Shaolin beliefs to more people. At the same time, the central government's grip on religion was starting to relax. Xingzheng took advantage of the "reform and opening" policies of Deng Xiaoping to push for greater independence for the temple, traveling frequently to lobby officials in the provincial capital and Beijing. He would often bring along Yongxin, who became known as Xingzheng's "walking stick."

In his memoir, Shaolin Temple in My Heart, Yongxin remembers traveling on the cheap, eating bread they'd packed themselves and staying in bathhouses. (Yongxin, through spokesman,

declined several

requests to be interviewed.)
He met officials and learned the importance of political connections. Xingzheng successfully persuaded the government to let the monks wear robes again and to allow ticket sales, which generated an income for the temple. In this radically open economic landscape, Yongxin saw firsthand how the temple could leverage the Jet Li miracle into security, autonomy, and growth.

Some accounts suggest Yongxin became too keen a student of power. According to a recent report by Sina News, a Chinese news portal, in 1986, as Xingzheng was preparing for a ceremony that would officially make him abbot, he couldn't find a necessary scroll.

Those inclined to believe the charges saw in Yongxin a

classic the outwardly pious religious leader exposed as a

Xingzheng accused Yongxin of stealing the sacred object out of a desire to become abbot himself. At first Yongxin denied the charge, then reportedly admitted guilt and gave the scroll back. Xingzheng also learned that Yongxin had been referring to himself as Shaolin's "second in command," and sometimes even as "abbot," according to Sina.

Xingzheng expelled Yongxin from the temple, according to documents posted by Shi Zhengyi and statements by people who were at Shaolin at the time. But Yongxin refused to leave, even when, per one account, some monks took his bedding and personal items and threw them out of the temple. A year later, documents released by Shi Zhengyi appear to show, a new "honorary" abbot, Shi Dechan, again tried to kick Yongxin out. He wrote a letter to the Buddhism Association of China enumerating Yongxin's alleged offenses, including inciting monks to beat up an electrician. Again, Yongxin refused to be

dismissed. The farm boy who had come to Shaolin wishing to come and go like the clouds and the fog had learned the power of staying put. He built his own base of supporters and, with higher-ranking monks either too ill or too unpopular to take charge, eventually emerged as the de facto leader of the temple, the monk with the clearest ability to continue the modernization that Xingzheng had begun.

In 1995, Yongxin organized a celebration of the Shaolin Temple's 1,500th anniversary, inviting government officials, Buddhist leaders, and thousands of guests from around the world. In a clever bit of political theater, he put on display a memorial tablet commemorating the 50th anniversary of China's victory over Japan. The five-day celebration got extensive media coverage and helped establish the Shaolin Temple as the preeminent monastery in China. "It was exceptionally successful," Yongxin wrote in his memoir. Four years later, he went through the official induction ceremony and was named 30th abbot of the Shaolin Temple. He was 34 years old. "I always persist in things that I am determined to do," he wrote. "People might not understand for the moment, but everything will become clear at last."

'd heard a lot about the commercialization of the Shaolin Temple, but nothing could prepare me for my first encounter with Buddhism Inc. I paid the steep \$16 entrance fee and walked the long, tree-lined path from the front gate of the Songshan Shaolin Scenic Area to the temple. The lilting theme song from Shaolin Temple, the movie, played from speakers in the trees. Tour groups congregated in front of the temple, snapping photos of its front steps, sloping tile roofs, and, despite a rule against it, the occasional monk. A man in a puffy jacket offered to sell me a Photoshopped picture of myself with Yongxin and Vladimir Putin flanking me like bodyguards. I shelled out \$30 to see the 400person nighttime Shaolin Zen Music Ritual, and caught a kung fu performance where the stage was emblazoned with the name of a tire company. In the mall-like gift shop, I bought a toy gun.

One evening I was sitting in a nearby guesthouse, reading a





Yongxin was surrounded Yongxin, they never stuck. When he addressed them, it was only in koan-like utterances. "If these things are problems," he once told a reporter, "they would have become problems by now."

In November, I visited Qian Daliang the same copy of Yongxin's

memoir, when an old man with a long white beard shuffled over. His son accompanied him and said his father had studied at the temple long ago. The old man stepped to the center of the room and performed an elegant kung fu routine, striking and kicking invisible enemies. Here it was, I thought: living heritage, unsullied by crass commercialism. When the man finished, I applauded and went to shake his hand. "Now give me some money," he said.

But he was also cutting rivals out of the Shaolin economy

In his book, Yongxin describes his goal for the temple not as commercialization, but rather the preservation and spread of authentic Shaolin culture. To do that, he argues, requires that monks be engaged in the secular world. "It seems that in people's minds, monks worthy of respect should do nothing but chant prayers," he writes. "I do not think that way." He rejects the CEO Monk nickname, but based on past statements, his aim isn't radically different from that of a Fortune 500 company: growth. Yet growth requires efficiency, rational management, and creative destruction, which don't always suit religious leaders.

If Shaolin is commercial now, it used to be worse-or at least tackier. In the mid-1990s, the area surrounding the temple was filled with souvenir shops selling prayer beads, figurines, swords, and Tasers. There was a roller coaster simulator and a house of horrors with a petrified cadaver. One of Mao's private planes stood on display. The dirt road to the temple was lined with competing martial arts schools, where students trained to become, typically, kung fu coaches or military personnel, and occasionally Shaolin warrior monks. "They were dazzling, in a weird way," says Gene Ching, a Shaolin disciple and associate publisher of Kung Fu Tai Chi magazine who first visited in 1995. "My favorite was watching two kids assigned to clean up the street. They got in a fight over a dustpan. At first it was typical push-pull, then one kid trapped the other kid's hand on the dustpan and put him in an armlock, and the other kid did a tornado kick to disarm him."

Upon becoming abbot in 1999, Yongxin decided to clear out the dreck. "Who would want to visit this filthy and chaotic place?" he wrote. He lobbied the local government to approve demolition in the area and helped pay for it with what he said was the majority of the temple's savings. Villagers, whose livelihoods were jeopardized, picketed and held banners denouncing the abbot, but in 2002 the forced relocation proceeded. Yongxin was pleased. "Now it possesses a little bit of the poetic charm that I have long cherished for the Shaolin Temple," he wrote. The project dovetailed with his trademark-protection litigation, as he sought to control the temple's image locally and abroad. When Yongxin first tried to lay exclusive claim to the name Shaolin, he found that 57 other parties had already registered the trademark in China, as well as 18 in the U.S. and 228 in Japan. After numerous lawsuits, all rights to the name were transferred to the temple in 2009. Yongxin was instilling the modern tenets of brand discipline on a 1,500-year-old faith. But he was also creating a long list of enemies who had been cut out of the Shaolin economy.

As Yongxin's fame grew, his critics accused him of living an increasingly extravagant lifestyle-especially for a monk. In 2006 the government of Dengfeng gave him a Volkswagen SUV worth \$125,000 as thanks for his contributions to tourism. "I dream of getting a bigger prize next year," he said at the time. Three years later, he was again denounced for showing off a cloak with gold thread worth \$25,000. He said it was a gift from a brocade company in Nanjing as an example of their shared "intangible cultural heritage." Allegations of more serious misbehavior began to appear in 2011, when someone claimed online that Yongxin had been caught visiting prostitutes during a police raid. The State Administration for Religious Affairs issued a statement saying the report was only a malicious rumor. Whatever controversies

Shaolin Intangible Assets Management Co. Ltd., which Yongxin had established to oversee the temple's many subsidiaries. In his spare office inside the temple walls, Qian-the surname means money"–turned on a small, ineffectual space heater and made tea while he told tales of the Shaolin monks' greatest financial battles. "Religions should be independent, and economic independence is the most important part," he said. One of Yongxin's most significant stands had been with the local government over the issue of allowing the temple to sell tickets–the campaign Abbot Xingzheng had started. Eventually, Qian said, the government agreed that the temple would receive 30 percent of the revenue rom ticket sales to the Songshan Shaolin Scenic Area, in which the temple is the main attraction. Temple insiders suspect the local government is trying to reduce ts financial dependence on Shaolin. In 2010 the city of Dengfeng started developing plans for a competing temple, to be called Tianzhong. Construction began but was soon delayed. According to a report in *Caixin* magazine, although Yongxin expressed outward support for the project, many locals believe he played a role in stalling it by raising objections that the construction would damage old relics. Work was halted in May, two months before Shi Zhengyi launched the public crusade against Yongxin.

he highway connecting Dengfeng to the Shaolin Temple passes a dozen martial arts schools-tall, gray buildings crowned with almost identical red lettering, most containing the name Shaolin and many run by former monks. Some relocated there after Yongxin's demolition; others have been erected since, sometimes with temple funds. The schools, which bring in tens of thousands of students every year, including wealthy foreigners, have over the years turned into gold mines for their owners. In 1997, Yongxin reportedly dispatched his disciple Shi Yanlu to found the Shaolin Warrior Monks Training Base and invested 15 million yuan (\$2.3 million) in the school. Yanlu, a sinewy specimen, especially compared with Yongxin's melted-candle figure, had grown up poor in Shandong province and came to Shaolin in 1987. He eventually became a respected warrior monk and one of Yongxin's loyal aides. During the abbot's 1999 induction ceremony, Yanlu stood behind Yongxin, holding his umbrella.

Yanlu's school became one of the most successful in the region. It maintained close ties with Shaolin: Yanlu would send his best students to perform in the temple's kung fu shows, as well as in the lucrative Shaolin Zen Music Ritual song and dance show. Yongxin allowed Yanlu alone to maintain a recruitment office inside the temple.

Over time, the relationship frayed. Yanlu began to receive his own highprofile visitors, including the prime minister of Hungary and the king of Cambodia. Temple leaders suspected that Yanlu was no longer sending his best pupils to participate in Shaolin performances, keeping them instead for his own school's shows. Yanlu further distanced himself from Yongxin when he bought a piece of land and began advertising an ambitious new program called Shaolin Soccer, without involving the temple. Yanlu and Yongxin would squabble over money. According to Yanlu's report to the government, starting in 2005, Yongxin began asking Yanlu for money. "He was insatiable," Yanlu's spokesman told Caixin. Yongxin denied this, saying he "never asked for a cent." Yanlu also claimed that Yongxin forced him to pay 2 million yuan to the Shenzhen businesswoman with whom the abbot allegedly had sex. "He was the abbot, so I had to do what he said," Yanlu wrote. "After that, he warned me not to raise the issue of the money or else I'd be kicked out of the temple."

Yanlu has faced his own charges of sacrilege. Several years ago, a photo reportedly circulated in the Shaolin community of Yanlu with his monthold son. As Qian Daliang explained it to one news outlet, Yongxin confronted Yanlu and told him to stop

wearing the monastic robes. From then on, when they met in person, Yanlu would dress in everyday clothes, but he still wore the robes at school events. His role as headmaster depended on his image as a pious Shaolin warrior monk—without that, he could lose everything. Yanlu didn't respond to requests for comment sent to his spokesman.

Tensions exploded one day in 2013, when a group of Yanlu's students tried to enter the Shaolin temple without tickets. A fight broke out

between the students and the Shaolin monks guarding the gate, and the police arrested two of the guards. After that, Yongxin closed Yanlu's student recruitment office and, according to reports, officially expelled him from the temple.

n November, the year's first snowfall blanketed the monastery. Nearly four months had passed since the charges against Yongxin went viral, and the results of the state investigation still hadn't been announced. The initial blast of chatter about his fate had quieted to a low hum. No one wanted to talk on the record: Those who had already voiced support for Yongxin had nothing to add, while those who had denounced him didn't want to say more in case he kept his job after all. As time went on and nothing changed, the locals were beginning to consider the possibility that the abbot, as he had survived past crises, would weather this one. That would be an astonishing anticlimax, given the dynamite nature of the charges, but one they had to consider-knowing the extent of Yongxin's power, the thinness of the evidence, the bias of the accusers, and the capriciousness of the Chinese legal system.

Then, on Nov. 28, the Henan government released partial results of its investigation. The authorities had split their probe into two parts, one focusing on "disciplinary" charges and the other on "economic" ones. Yongxin was cleared of the former. The claims that he fathered two children were false, according to the report: One of them was in fact adopted by the nun with whom Yongxin had allegedly fathered the child, and anyway the woman had become infertile after an operation; a paternity test revealed that the other was the child of Yongxin's younger brother. The state's report also rejected the claim that Yongxin had been expelled from the

The state's report also rejected the claim that Yongxin had been expelled from the Yongxin with Jackie Chan

monastery in the 1980s. In an interview with a Henan newspaper, a member of the investigation team said the expulsion had been "a personal matter" and was "invalid" because it was not approved by the proper government authorities.

The results of the "economic" investigation haven't yet been released. (Nor have investigators explained their unusual choice to publish in thematic installments.) But the findings so far suggest that Yongxin may be headed for exoneration, or at the most a slap on the wrist. The "disciplinary" results are conspicuously incomplete: They fail to address the rape accusation, as well as the charge that Yongxin slept with the Shenzhen businesswoman. Verdicts on these charges don't appear to be forthcoming.

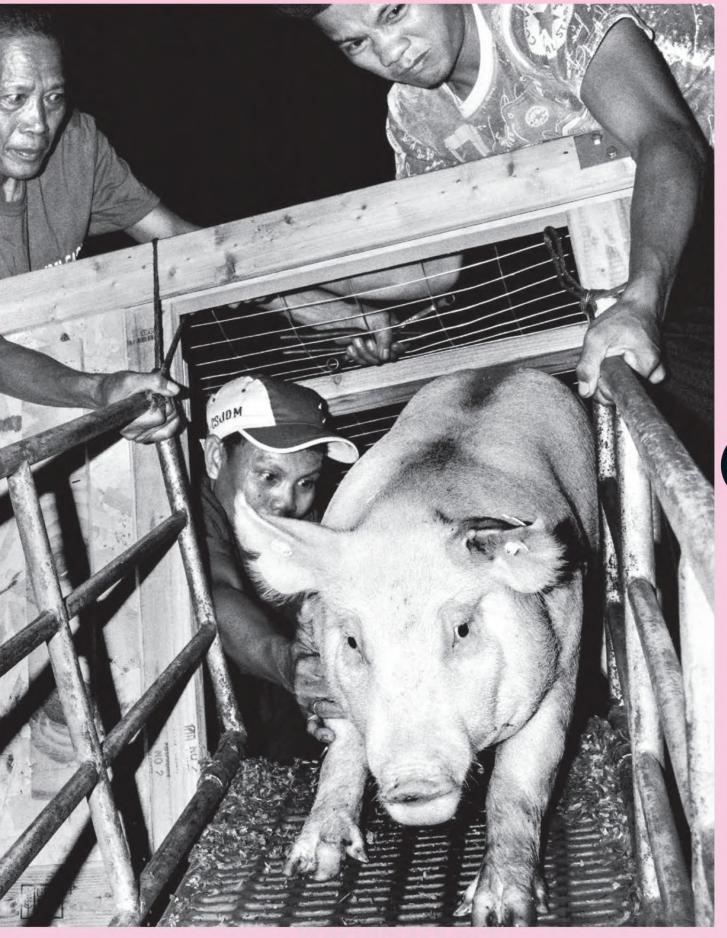
The public response has been predictably cynical. One Chinese netizen spoke for many when he wrote, "He's a good Party monk, of course he can't have problems." The point being, whether he's guilty or not, Yongxin is too big to fail. If he did, given the gravity of the charges, he would take countless others down with him.

It's true that many party leaders have lost their jobs in recent years because of the anticorruption campaign, and those who fight their accusers rarely win. But those officials have been targeted by the upper rungs of the party. The small group that fingered Yongxin included rogue disciples who had axes to grind. From a stability perspective, his ousting would cause more problems than it would solve. Moreover, he's a powerful symbol for the Chinese government. His success showcases not only China's tolerance for organized religion but also the country's soft power. Shaolin has reached new audiences through every manner of pop culture, from Stephen Chow movies to The Simpsons to the Wu-Tang Clan, whose latest album is titled Once Upon a Time in Shaolin. At a time when China can't

> seem to win an Oscar or produce literature that travels well, the fact that American teenagers know the name Shaolin is a source of pride.

> During my visit to the temple, I went by the office of Wang Yumin, the head of foreign affairs, and told him I wanted to write about how the temple had become so successful under Yongxin. "Successful?" Wang said. He laughed bitterly and gestured around him as if the allegations dogging Yongxin were physical objects in the room. "We don't think it's very successful."





USDA ECONOMIC RESEARCH SERVICE, OECD, UN FOOD AND AGRICULTURE ORGANIZA

hree hundred thirteen-five is a beauty and sure to have beautiful babes, too. Born on March 30, the fifth piglet in litter 313, she's an elite sow, bred to produce several generations for the product will ultimately.

of breeding pigs that will ultimately produce delicious piglets—a lot of them. She's a Yorkshire, a breed known for strong maternal traits, such as the size of their litters, the birth weight of their piglets, and a relatively short interval between litters. The best ones grow up fast and also produce lean meat.

Even among Yorkshires, though, 313-5 comes from exceptional stock. Her father, a boar with the romantic name BTI4 the Unit 30-6, was ranked, as of Dec. 15, sixth in the U.S. among Yorkshires on the "sow productivity index," a measure of maternal traits, and fourth on the "maternal line index," which combines maternal traits with edible traits, such as stores of back fat and muscle. Her mother is a descendant of the late Wisconsin Steel, the champion boar at the 2009 Wisconsin State Fair; the name is a play on the relatively cheap price, \$2,500, paid for the boar-a "steal" for such a productive stud. In short, 313-5, her children, and even her grandchildren will be bred to breed and enhance a widening gene pool. Her great-grandchildren, though, will be raised for slaughter. And though she doesn't know it yet, she's going global. She's headed to the Philippines.

One evening in May, several men weighing 313-5's fate gather in a

conference room in rural Albion, Ind., for a sales presentation on a "customizable approach to genetic improvement." The room is in the basement of Whiteshire Hamroc, a 20-year-old company that specializes in swine genetics, the porcine equivalent of rose breeders crossing hybrids to yield a singular flower. A map of China adorns one wall, and framed aerial photographs of Whiteshire Hamroc's farm hang on the others.

Mark Brubaker, an applied geneticist, works through a PowerPoint presentation that rates the farm's pigs with statistical precision—feed-conversion ratio, estimated breeding value, terminal sire index. He boasts that the data paint a picture of "pounds of pork through a system," and "how efficient that system is." But don't get the wrong idea. These are animals, not pounds of pork, adds Scott Lawrence, director of domestic sales and marketing. "Our philosophy is: How can we advocate for the pigs?"

Edwin Chen listens attentively, interrupting occasionally to parse the data. "The yield is with the head on or the head off?" he asks. (Head on.)

Chen is a slight 55-year-old with neatly parted black hair and wire-rim glasses. As president of Hypig Genetics, he oversees a 6,000-sow operation on several farms in the Philippine countryside. He wants to triple that number, in part by buying thoroughbred pigs from the U.S., where he says swine genetics is decades ahead of that in the Philippines. Chen says his family's desire to expand quickly is based on potential as much as current demand. The gross domestic product per capita in the Philippines is about \$2,900 a year. When it reaches \$5,000, Chen predicts, demand for meat will explode.





2014

"We have to get ready," he says.

2001

1989

Chen has come to Albion as Tony Clayton's guest. Clayton, the president and owner of Clayton Agri-Marketing, is a paunchy 55-year-old in jeans and a blue, short-sleeved button-down shirt with his company's name on the breast pocket. He ships breeding livestock around the world, a business that's booming because of growing demand for meat and milk in the developing world. Clayton converts pounds to kilograms for Chen and remarks on the value of different metrics for measuring the worth of a particular pig. After a lunch of cold cuts (including ham), chips, and cookies, Clayton and Chen climb into biohazard suits and bootees and enter a barnyard showroom. Standing behind a glass partition overlooking a livestock pen, they critique one group of pigs after another as the animals trundle in for inspection.

"I like a pig that when you walk in the room, it's like, 'Brrrr!'" Clayton says, using a shorthand to recommend frisky pigs, part of a running commentary. "I don't like a deadheaded pig. I like a big, athletic pig."

Chen, snapping a few pictures, doesn't say much. At one point, he asks to see pigs with broader shoulders. Those tend to be meatier. Admiring a group of rust-colored gilts, the term for young females, he says, "Good vulva size."

At the end of his tour of Whiteshire Hamroc, however, Chen doesn't buy any pigs. "You don't just buy animals," he says. "You buy genetic progress."

He visits three more Midwestern farms—in Illinois, Nebraska, and Iowa—as well as the World Pork Expo in Des Moines, before directing Clayton to purchase 230 pigs: 35 boars and 195 gilts. Of those, 86 come from Whiteshire Hamroc's Indiana farm,

At Whiteshire Hamroc: Clayton (left) discusses various types of pigs with Chen; Jessica Weirick, a farrowing manager (above right), processes a newborn piglet



including pig 313-5, which costs Chen \$1,485, including shipping and handling. He expects 313-5 to be near the top of a production pyramid, multiplying its U.S. genetics through his herd.

On a night in July, a little more than a month after Chen's Indiana tour, 313-5 arrives at a warehouse adjacent to Chicago O'Hare International Airport. She's asleep in the back of a tractor-trailer, flopped in a pile of slumbering swine, all about her age and weighing 110 pounds or so. The temperature is about 60F—"perfect pig weather," says Clayton, who's waiting near a loading dock in overalls, a cap, and plastic bootees.

Before 313-5 made it to the warehouse, she passed a battery of tests to ensure she was free of diseases. Then she spent a day at a quarantine facility on Chicago's outskirts, where government inspectors made last-minute checks. Rousted from sleep, 313-5 and the others straggle and squeal as they're led out the back of the truck. Clayton and his crew use plastic paddles to direct the animals into wooden crates about 10 feet long, 8 feet wide, and 10 feet high. The crate carrying 313-5 is divided into three levels, each with wood shavings on the floor and a pipe filled with water and electrolytes to keep the pigs hydrated. There are about 17 pigs per floor.

Over the next four and a half hours, Clayton oversees the unloading of "I LIKE
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WHEN YOU
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I LIKE A BIG
ATHLETIC PIG"

655 pigs belonging to 15 customers in the Philippines. The swine are separated by size and customer; the orders range from Chen's 230 pigs to just one. Six boars, a few months older and bigger than the other animals, are put in a separate compartment, "so it doesn't turn into a prison shower scene," Clayton says.

Fourteen crates are loaded with pigs, and customers' names are stapled to the side of each one; the paper affixed to 313-5's says "Hypig," the name of Chen's company. A forklift settles each container onto a flatbed truck for the short drive to the tarmac at O'Hare. There, one by one, the crates are carefully loaded onto the main deck of a Boeing 747 cargo jet bound for the Philippines.

Clayton's gotten pretty good at this over the past five years, his busiest since he started his company in 1996. A native of southwest Missouri, he aspired to take over his family's farm, but a weak economy led him elsewhere, as a hog buyer, an auctioneer, and a bureaucrat at the Missouri Department of Agriculture. In his two decades as a livestock exporter, Clayton says demand from developing markets has come to represent about 70 percent of his business. In the past year, Clayton has flown pigs to Britain, China, South Korea, Malaysia, and Vietnam, as well as the Philippines. He also sent pig semen to Colombia, Mexico, and Ukraine



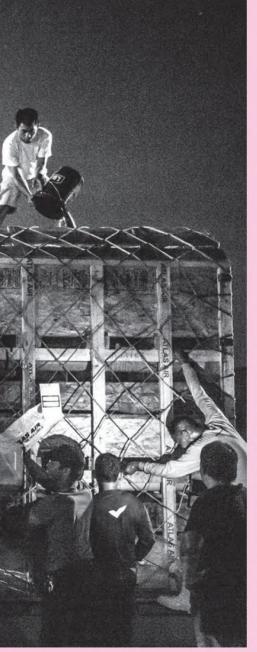


and his first shipment of dairy cows to Sudan and Vietnam, both by boat. (Pigs don't travel well by boat because of the voluminous quantity and ammonia content of their waste.)

"I can throw a dart at a map right now, and there's something going on," says Clayton, who says he was on the road more than 200 nights in 2015. "It's like Brad Paisley's line in *Welcome to the Future*: 'Wherever we were going, well we're here.'"

Clayton's recent run of success reflects a fundamental change not only in diets but also in farming methods in much of the developing world. A growing middle

Unloading a crate of pigs at a former U.S. military base in Pampanga, Philippines (above); one makes a break for it. The Cavite Pig City pen, outside Metro Manila (right)



according to MarketsandMarkets, a research firm.

Clayton's business is fraught with financial risks and potential catastrophes. Exporters must navigate countries' various regulations, financing arrangements, and cultural norms. Animal diseases, currency fluctuations, and politics can quickly destroy markets.

"When it's all said and done, most people get tired and just can't stand that level of risk," says Jay Truitt, executive director of the Livestock Exporters Association, who estimates Clayton has a half-dozen head-to-head competitors. A few dozen more focus on one species or country.

Oscar Kennedy, a Virginian who retired from the business last year, says shipping livestock by plane didn't become a viable commercial enterprise

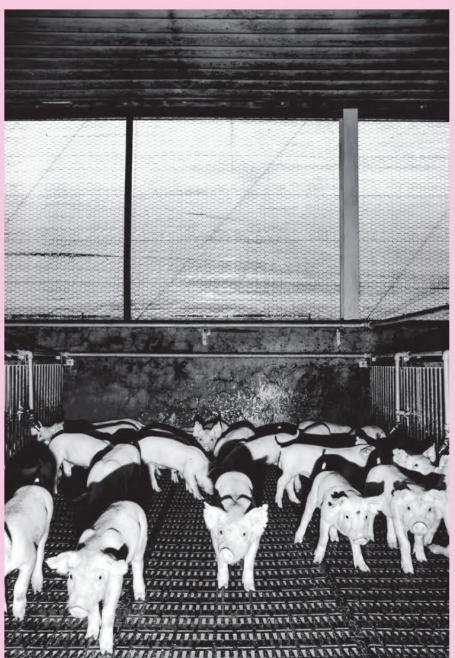
until the late 1970s or so, driven by demand in Eastern Europe. In those early days, he says, he struggled to persuade his clients to properly secure the animals once a plane landed.

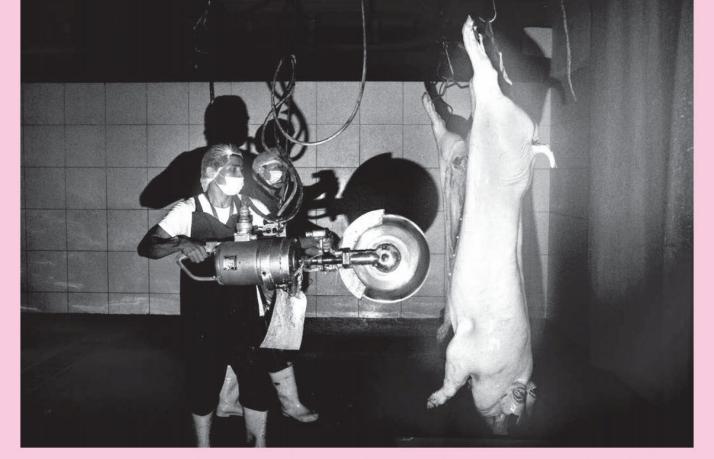
In one instance, a dairy cow got loose in Belgrade and crashed through the window of an airport restaurant at lunchtime. In another, a Texas rancher shipped four American buffaloes with a shipment of livestock to Hungary, but the animals burst out of their crates while the plane was being unloaded. "I think only one survived," Kennedy says.

Clayton has his own war stories. Last year the air conditioning malfunctioned on a plane full of pigs headed to the Philippines. Before long, the pigs started "screaming and going crazy," and the windows of the plane, including those in the cockpit,

class is spending its extra money to buy more meat, eggs, and milk. To meet the demand, traditional backyard-style farms in places such as the Philippines are losing market share to larger, more industrial operations, the kind snubbed by American critics as "factory farms."

Buying elite DNA-either frozen or chilled semen, frozen embryos or live animals—is a logical next step, jump-starting a process that normally takes decades of selective breeding. It's the farm equivalent of upgrading software or technology, betting that the long-term gains outweigh the short-term costs. The animal genetics industry, valued at \$2.5 billion, is expected to increase an average 9 percent per year through the end of the decade, fueled by growing meat and dairy consumption and improved breeding technology,





fogged over as the plane heated up. "Everybody was nervous," Clayton says. "It got concerning enough that we were looking for a place to get the plane on the ground as quickly as we could." It landed safely in Manila.

As the 747 lifts off from Chicago for a 17-hour flight, 313-5 settles in to sleep. The plane lights are kept dim, and the temperature is a cool, pig-friendly 55F. Clayton rides along with the pigs, making sure the air conditioning doesn't conk out again, and eventually tries to catch some sleep in the upper deck. He occasionally reads a book called *Spillover: Animal Infections and the Next Human Pandemic*.

When 313-5 arrives in the Philippines, it's dusk and a deep blue sky looms over the remains of a sweltering day. Every pig survives the flight, and the crates are slowly lifted onto the tarmac of a former U.S. Air Force base an hour and a half north of Manila, surrounded by rolling tropical hills. There are rain clouds overhead, and the temperature is 30 degrees warmer, the air vastly more humid. It's not perfect pig weather.

Farmworkers wait outside the gate, on idling pickup trucks and livestock carriers, as the plane taxis to a stop. They eat watermelon and share fried chicken from a local Jollibee, a Philippine fast-food chain.

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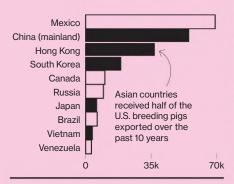
The crates are unloaded one after another, then pulled on a cart across the tarmac to a waiting area and cleared by Filipino authorities. Once the containers are pulled outside the gate, workers pounce, spraying water onto them and tossing ice and watermelon inside to cool off the pigs. Others climb on top and begin cutting away the netting that secures the crates to aluminum pallets on the airplane. Clayton stands amid the commotion in a sweat-stained plaid shirt, jeans, and cap, checking identification numbers against the packing list to make sure his clients get the right pigs.

The farmers with smaller orders create makeshift ramps and prod the animals toward their trucks; some even climb into the crates and drag the pigs out by hind leg or ear. Among them is Jeffrey Sarmiento, who drove two hours from his farm to pick up his order—one Landrace boar from Waldo Farms in Nebraska, ear notch 148-1.

Sarmiento, who has a 250-sow farm, says he'd previously purchased the progeny of a Waldo Farms pig, and "the results were amazing." So this time he decided to invest in his own American

Butchering a pig at Parañaque Meat Processing & Slaughterhouse (above). Bacon on display (above right) at SM Markets in Manila (bottom right)

Top destinations for U.S. breeding pig exports, 2004-14



pig. Based on estimates that his stud will produce piglets that grow quickly and require less feed, he says, "I am assured that I am getting my money's worth."

Bigger customers such as Chen use forklifts to heave the crates onto flatbed trucks. In the process, one of Chen's pigs escapes, a Whiteshire Hamroc gilt, 295-6. Several workers chase the animal back into its carrier, and before long the trucks drive off into the Philippine darkness. Two and a half hours later, 313-5 arrives at her new home, Macapagal Farm in Bulacan province, in a lush valley with the Sierra Madre Mountains as a backdrop.

Eight weeks later, 313-5 is lounging with nine other gilts in an indoor pen. Now 5 feet long and a muscular 236 pounds, she spends 19 hours a

DATA: USDA ECONOMIC RESEARCH SERVICE. OECD. UN FOOD AND AGRICULTURE ORGANIZATION



day snoozing, one way of acclimating to the steamy conditions.

"We expect 313-5 to be a good breeder, given her good genetics," says Filip Madelozo, Chen's production manager, admiring the pig's lean physique. "If she can farrow 12 to 14 pigs, that would be good."

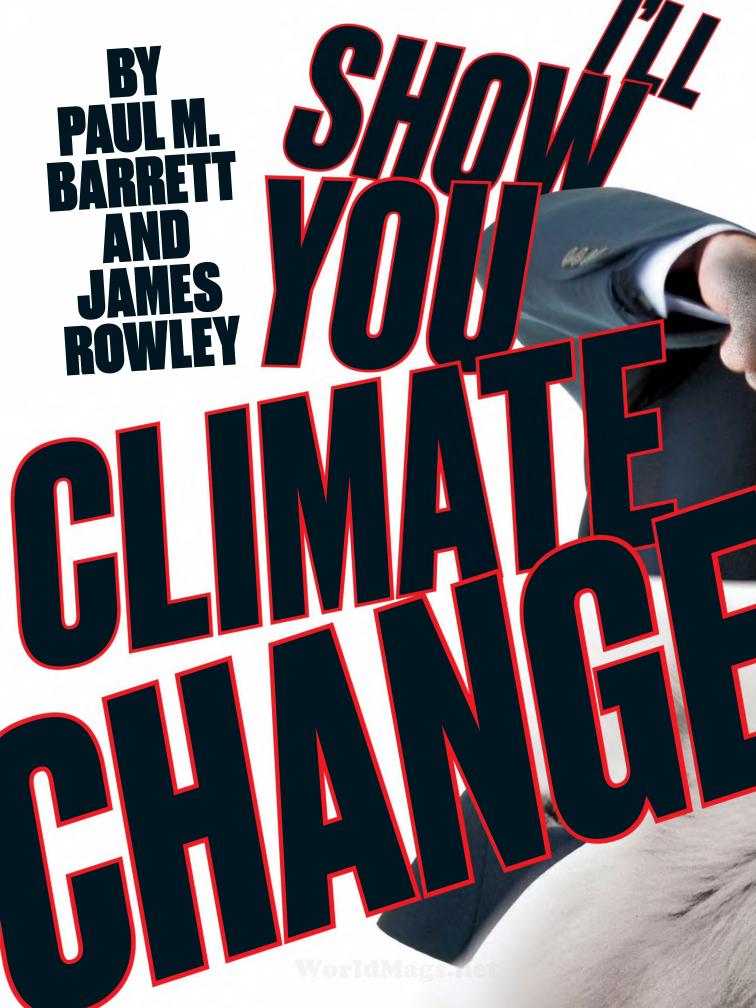
The leisurely lifestyle doesn't last. On Sept. 10 the gilt is shipped to another of Chen's farms, where she'll spend the rest of her life producing piglets, preferably a litter about every five months. By November she weighs 355 pounds and is impregnated with a plastic tube of semen.

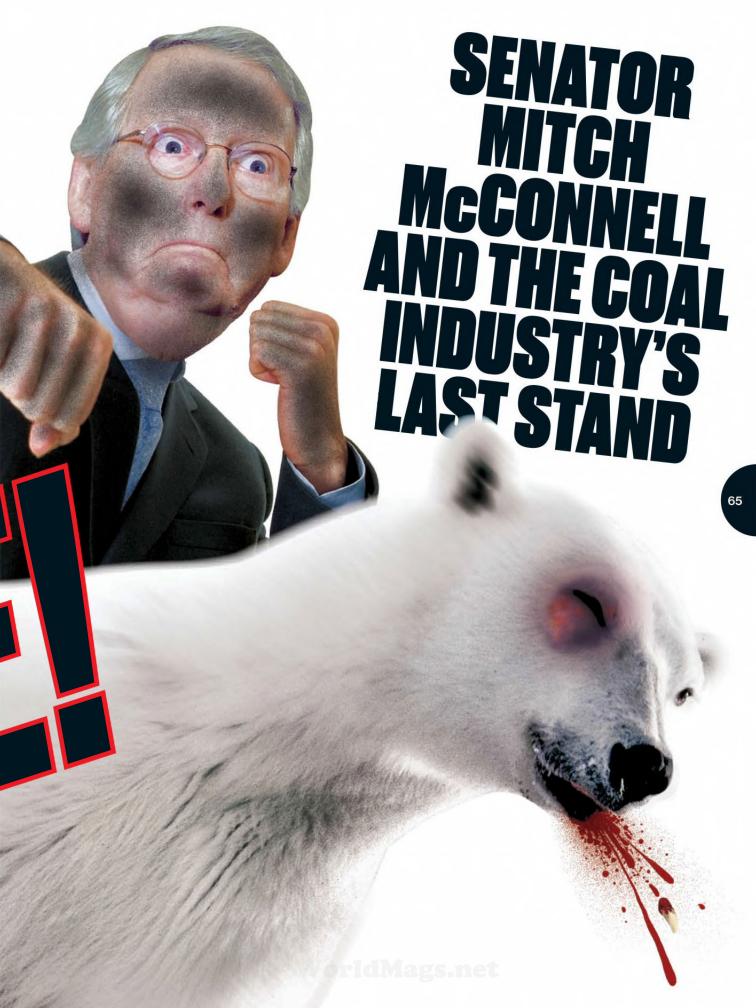
The donor? A handsome Indiana stud named Zook 383-11, the top-performing Yorkshire male in Whiteshire Hamroc's herd, says company president Rebecca Schroeder. A batch of his semen was flown to Chen's farm in November. "Another level of online dating," Clayton quips.

If all goes as planned, 313-5 could have her first babies in March. "Her present status today is presumed pregnant," says Madelozo, who planned a confirmation test on Christmas Eve. "We're just hoping she conceives."

—With Norman Aquino and Philip Montgomery







ballad called Coal Keeps the Lights On took singersongwriter Jimmy Rose of tiny Pineville, Ky., all the way to the finals of America's Got Talent in the summer of 2013. AGT judges Howard Stern, the radio shock jock, comedian Howie Mandel, and supermodel Heidi Klum cheered and clapped. "That was a damn good song," Stern declared. Rose, a 36-year-old former coal miner, says highlighting the industry's plight was a deliberate choice: "It's a song about a way of life that's in danger of disappearing."

Almost exactly a year later, the singer's minor celebrity took him to a less likely venue: the ornate main hearing room of the Environmental Protection Agency, where he testified at the invitation of Mitch McConnell as part of the Senate majority leader's defense of coal. The effusive Rose and the dour McConnell made an odd pair. When Rose stood to lead a spontaneous Pledge of Allegiance, an evidently surprised McConnell had to scramble awkwardly to his feet. Rose went on to outshine McConnell with a passionate condemnation of EPA regulations he said are turning eastern Kentucky into "a war zone." "You won't come to this poverty-stricken area," he lectured EPA officials. "You won't come and look my people in the eye."

Rarely dramatic, McConnell read his testimony in a characteristic drone. Even though he's from Kentucky, the lawmaker doesn't claim long-standing ties to coal. Before coming to the Senate, he says, "as a lawyer in Louisville, was I paying attention to coal? Not much." But since President Obama took office in 2009, vowing to combat climate change, McConnell has positioned himself as coal's bulwark-a central element of his acrossthe-board campaign to thwart the president politically.

Coal needs all the friends it can get. The industry is under siege from federal regulation, most recently Obama's Clean Power Plan, which went into effect on Oct. 23 and seeks to reduce carbon emissions by 32 percent by 2030. Consumers and activists, meanwhile, are persuading utilities to close aging coal-fired power plants. With funding from Bloomberg Philanthropies, the Sierra Club's Beyond Coal campaign has helped shut down more than 220 coal facilities over the past five years. (Bloomberg Philanthropies was created by Michael Bloomberg, founder and owner of Bloomberg LP, which publishes this magazine.)

Even more damaging than pressure from environmentalists has been competition from plentiful, inexpensive natural gas-a cleaner-burning source of electricity increasingly favored by utilities. Coal provides 39 percent of the nation's power, down from 50 percent a decade ago. Some 8,000 jobs have disappeared just from the coalfields of eastern Kentucky since 2010. Says Rose: "A lot of people are counting on Senator McConnell to figure something out."

The fight can seem quixotic, given the challenges facing coal. The recent Paris agreement among nations to reduce carbon dioxide emissions puts the industry under even more pressure, but McConnell welcomes the mission. He's executing it with broad gestures as well as obscure legislative maneuvers. He hopes the hybrid strategy keeps Democrats occupied until November 2016, when Republicans have a chance to retake the White House and reverse the Obama regulatory offensive.

"It's a last stand; the forces arrayed against coal are too powerful to resist," predicts David Doniger, director of the climate program at the Natural Resources Defense Council (NRDC). "The trouble with last stands, though, is that they can go on for a long time, and McConnell is a very determined fighter."

Addison Mitchell McConnell, 73, has built a three-decade Senate career on political savvy and procedural mastery. During an interview in his Capitol office, he avoids personalizing

his relationship to the coal business. Asked about coal being woven into Kentucky's DNA and what that means to him, he responds: "Yeah, I think we figured out that it was a big issue in our state beyond the coalfields starting in 2012, when Congressman Andy Barr defeated Ben Chandler in the central Kentucky district where there are no coal mines." Barr, a Lexington Republican, ousted the Democratic incumbent by linking Chandler to Obama's efforts to curb carbon dioxide emissions from coal-powered utilities. To McConnell, any attempt to arrest global warming requires a return to medieval destitution, especially for his constituents: "I mean, in what way is it helpful to have the planet have more and more people living in poverty, more and more people in the dark-literally in the dark-potentially?"

The Senate majority leader didn't begin his career as an archconservative. In a then-predominantly Democratic Kentucky, he rose through Republican Party ranks in the late 1960s and early '70s as a moderate. According to a recent biography by journalist Alec MacGillis, he named his cat Rocky after Nelson Rockefeller, the generally liberal Republican governor of New York. (An aide says the cat belonged to McConnell's ex-wife.) McConnell opposed Ronald Reagan's first two bids for the GOP presidential nomination, supporting President Ford in 1976 and George H.W. Bush in 1980.

He began changing direction in 1984, when, under the tutelage of consultant Roger Ailes, now the head of Fox News, McConnell won election to the U.S. Senate. He rode the Reagan revolution, supporting arms for the right-wing contra guerrillas in Nicaragua, "tort reform" that restricted consumer lawsuits, and conservative judicial appointments.

Backing coal went without saying for a member of Kentucky's congressional delegation, but it wasn't an issue to which McConnell devoted disproportionate attention. "He was there for coal but didn't have to worry about it much during the [George W.] Bush years, when federal policy was friendly," says Bill Bissett, president of the Kentucky Coal Association since 2010 and, before that, a public-relations professional in neighboring West Virginia. Utilities faced no organized national opposition in the early 2000s, when they proposed building scores of coal-fired plants to replace a generation of aging facilities.

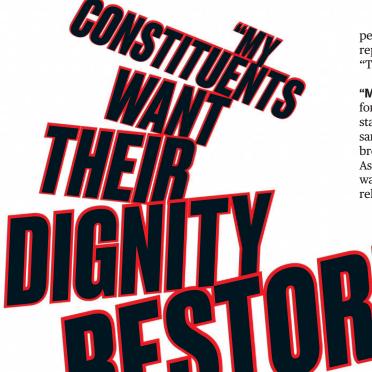
But then the market for coal shifted—and so did the politics. Natural gas made available by hydraulic "fracking" and horizontal-drilling techniques, combined with the 2008 financial crisis, scuttled plans for expanding coal. Today, the cost of natural gas electricity, including power plant construction, is about \$73 per megawatt hour, according to Charles Patton, president of Appalachian Power, West Virginia's largest utility. For a conventional coal plant, it's \$95.

Annual U.S. coal consumption peaked in 2007 at 1.1 billion tons and declined to 919 million tons in 2014, the least since

> earlier, in 1990, at 173 million tons. The state was displaced as the nation's No.1 producer in 1988 by Wyoming, home to the resource-rich Powder River Basin, which has cleaner-burning coal than Appalachia. "The deterioration in Kentucky has been pretty steady, but people always hoped things would turn around," Bissett says.

> > As its fortunes eroded, coal became an issue in the 2008 presidential campaign. In January of that year, candi-

ate Obama told the San Francisco Chronicle about his support for date Obama told the San Francisco legislation penalizing carbon emitters: "If someone wants to



perspective widely shared in Kentucky, where, McConnell says, repeated invites for visits from EPA officials have been rebuffed. "They don't want to see the face of this," he says of the EPA.

"McConnell is the one person nationally who's been saying for years that this is a war on coal, and he's right," says Kentucky state Senator Brandon Smith, a Republican. "We've lost thousands of jobs, and we have nothing to replace them." He's having breakfast at France's Diner in Hazard, the seat of Perry County. As waitress Shelly Napier pours coffee, she notes that business is way down at the restaurant (it's almost empty). Six of her male relatives have lost mining jobs in the past 18 months. "This is a

nice town," she says, "but you're seeing the worst of it—shut-down stores, empty buildings."

John Combs runs a chromeplating shop 90 minutes away in Pikeville that refurbishes hydraulic parts for bulldozers and other surface-mining equipment. In 2011 he employed 72 people; today, 38. In 2014, Combs hosted a fundraiser for McConnell (Rose performed). "I

give Senator McConnell all the credit in the world," Combs says, "but I don't know if he can stop this onslaught from Obama and the Democrats."

Brian Patton is president of Mountainside Coal, a company in Williamsburg, Ky., that mines high-grade coal used in the manufacturing of computer chips and solar panels. In the past year, with demand from China eroding, he's let go 40 of 140 workers. Before this gig, Patton worked for James River Coal, a larger company that filed for bankruptcy protection for a second time in April 2014. More than three-dozen U.S. coal operations have been forced into bankruptcy in the past three years, according to research firm SNL Energy. Many are small, but in addition to James River, the insolvencies include prominent names such as Alpha Natural Resources and Patriot Coal.

"This is more than a bad cycle; the shrinkage in thermal [coal used for electricity] is structural, and it's not coming back," says Jesse Parrish, vice president at Lexington, Ky.-based Blackhawk Mining, founded in 2010 to buy and combine the assets of failing coal companies. Blackhawk has trimmed payrolls and reduced benefits to retirees. Once a powerful protector of miners' rights, the atrophied United Mine Workers of America no longer represents any active employees in Kentucky's coalfields. "The politics has evolved from management vs. labor to a unified front of owners and workers trying to survive," Parrish says.

In his 2014 reelection campaign, McConnell won four eastern coal counties with predominantly Democratic electorates that he'd never won in five prior tries. And like Kentucky voters, the coal industry, though financially crippled, has expressed its gratitude. According to the Center for Responsive Politics, a Washington research nonprofit, McConnell's campaign committee received \$425,600 from mining interests from 2009 through 2014—an unimpressive amount that ranked only No.15 among the senator's contributors (securities and investment firms ranked No.1, with \$2.3 million). But what mining could muster for McConnell, the center's data show, made him coal's top Senate recipient.

Once reelected, McConnell became Senate majority leader, a career-long aspiration. The day after he won, he told the *Lexington Herald-Leader* that one of his top priorities would be "to do whatever I can to get the EPA reined in." His main target, he said, was the Clean Power Plan, then in preliminary form. Under the plan, the EPA sets individual state carbon-reduction goals that collectively achieve the 32 percent cut by 2030. States

build a new coal-fired power plant they can, but it will bankrupt them because they will be charged a huge sum for all the greenhouse gas that's being emitted."

After taking office the following year, Obama pushed a capand-trade bill that would have imposed a limit on power plant ${\rm CO_2}$, requiring heavy emitters to buy pollution credits from cleaner rivals. The House of Representatives, then controlled by Democrats, narrowly passed the legislation in June 2009. In the Senate, also dominated by Democrats, the bill faced a threatened Republican filibuster organized by McConnell.

For McConnell, coal was one battle in a much larger political war. Then the Republican minority leader, he had been fighting almost all of Obama's initiatives. "The single most important thing we want to achieve," McConnell told *National Journal* in 2010, "is for President Obama to be a one-term president."

He swung into action branding cap-and-trade a "new national energy tax." He and fellow Republicans lobbied moderate Democrats leery about supporting anything framed as a tax. McConnell even tried in a roundabout way to take advantage of the BP oil spill that summer, which had begun in April with the explosion of the Deepwater Horizon rig in the Gulf of Mexico. In a floor speech, he asserted the "inconvenient fact" that BP had "helped write" the cap-and-trade legislation. BP, like Shell and other major oil companies, had commented on drafts of cap-and-trade. Tarring the bill by association with BP seems desperate, but at the time it appeared to help. Democrats wavered. Then-Senate Majority Leader Harry Reid never brought cap-and-trade to the floor. "The reason Reid didn't want to schedule that vote is because he had too many red-state Democrats who weren't going to vote for it," McConnell says with an air of satisfaction.

After the defeat of cap-and-trade and Democratic setbacks in the 2010 midterm elections, Obama looked for ways he could move forward on climate change using his executive authority, a process that culminated in the Clean Power Plan. "It's really arrogant," McConnell says. "This is not the result of any law that's been passed, and so you've got unelected bureaucrats doing things that have a dramatic, depressing effect on the economy." That's a

may propose their own tailored programs, including such steps as boosting use of wind, solar, and other renewables; imposing pecuniary penalties on carbon emissions, possibly in combination with a cap-and-trade system; and switching electricity generation from coal to natural gas. If a state fails to develop a plan by 2018, the EPA will draft one for it.

The EPA maintains that it doesn't need congressional approval to implement the plan. McConnell disagrees. He's designated his top energy aide, Neil Chatterjee, to coordinate a multifaceted lobbying-and-litigation drive to stop the agency. "It's unusual to see a Senate majority leader play this role," says Bissett of the Kentucky Coal Association. "But there's really no one else there to do it, so Leader McConnell stepped up."

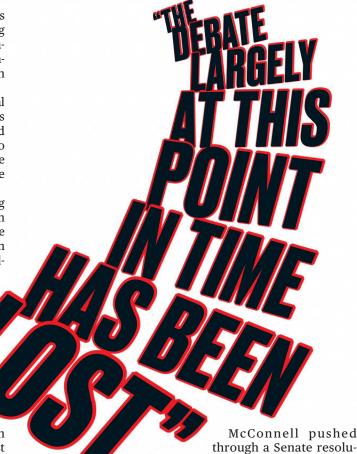
In March, McConnell sent letters to all 50 governors urging them to defy the EPA by simply refusing to comply with the Clean Power Plan. Simultaneously, his office served as a clearinghouse for state lawsuits seeking to stop the EPA in court. Twenty-seven attorneys general have filed suit so far, as have numerous utilities and coal companies. Roughly at the same time as his letter-writing campaign, McConnell's office helped orchestrate a House hearing chaired by Representative Ed Whitfield, a fellow Kentucky Republican. Whitfield's star witness was the well-known law professor Laurence Tribe of Harvard, who's been retained by Peabody Energy, the nation's largest coal company, to advocate against the EPA proposal. Arguing that the Obama administration was infringing on state authority, Tribe compared the Clean Power Plan to "burning the Constitution." "If I thought the case was a close one, I wouldn't have taken it on," Tribe says. "If I'm proven right on the law, then lots of time, money, and jobs will have been lost pursuing an important goal in an unlawful way." His hiring was a PR coup, given Tribe's pedigree and long relationship with the president. McConnell misses no opportunity to note the connection. "You know who Laurence Tribe is, right?" he asks during an interview. "He's the most prominent liberal constitutional law professor in the country."

Numerous other scholars have disputed Tribe's arguments for Peabody, but the lawsuits over the power plan are a serious matter and will almost certainly end up before the U.S. Supreme Court, possibly in 2017. In the meantime, it's unclear how many states will volunteer carbon-reduction plans, as opposed to waiting to see how the justices rule.

By contrast, some of McConnell's other swipes at the EPA are more symbol than substance. In March he offered a successful amendment to a nonbinding budget resolution that barred the EPA from denying states federal highway funds for noncompliance with the Clean Power Plan. "Washington bureaucrats shouldn't be allowed to punish innocent Americans by threatening the roads and bridges they use," McConnell said in a statement. This was peculiar, because the EPA lacks authority to block federal highway funds in this manner—and the agency immediately said so.

In another move, McConnell appointed himself to a Senate Appropriations subcommittee with jurisdiction over the EPA. At a panel hearing in April, he castigated EPA Administrator Gina McCarthy: "My constituents want their dignity restored. They want to be able to work."

McCarthy responded: "I believe the EPA has designed this plan in a way that we are respecting the current situation in states and their energy mixes, designing our standards to accommodate the reasonable benefits in terms of reducing carbon pollution, and what those states can do." She added: "We are acting under the authority that Congress gave us under the Clean Air Act, and we are going to be producing a rule that is going to withstand the test of time in the courts."



in November, a token vote with no practical effect, but one he intended as a signal to foreign diplomats gathering in Paris in December to negotiate with the U.S. over the global climate pact. His message, as expressed in an op-ed that appeared under his byline in the *Washington Post* on Nov. 27, was that "commitments the president makes [in Paris] would rest on a house of cards of his own making."

tion disapproving of the Clean Power Plan

On Dec. 12, the Paris climate conference approved an agreement favored by the Obama administration that seeks to limit global warming to less than 2 degrees Celsius (3.6 degrees Fahrenheit), using preindustrial temperatures as a baseline. In a statement, McConnell warned against celebration: "Before [Obama's] international partners pop the Champagne, they should remember that this is an unattainable deal based on a domestic energy plan that is likely illegal, that half the states have sued to halt, and that Congress has already voted to reject."

Doniger, the NRDC climate expert, says McConnell is waging a cynical—and ultimately losing—battle. "The only question he's asking himself is, 'How can I work this issue for partisan advantage?'" Doniger points to a speech in October delivered by Patton of Appalachian Power in which the utility executive, a foe of the Clean Power Plan, conceded that in the long run coal can't bounce back: "The debate largely at this point in time has been lost."

"I suspect that in his heart, McConnell knows that, too," Doniger says.

If the senator does know that the war over coal is unwinnable, he's keeping it to himself. He insists that in the 2016 presidential election, the Republican candidate could eke out victories in coal-reliant swing states by promising to kill the Clean Power Plan and rescue the industry. "It is an issue in southeastern Ohio and in western Pennsylvania," he says, "and if you're running for president, you've got to carry those two states." The Senate majority leader, in other words, is not yet raising a white flag. **9**



NATURE CLEANS OUR AIR



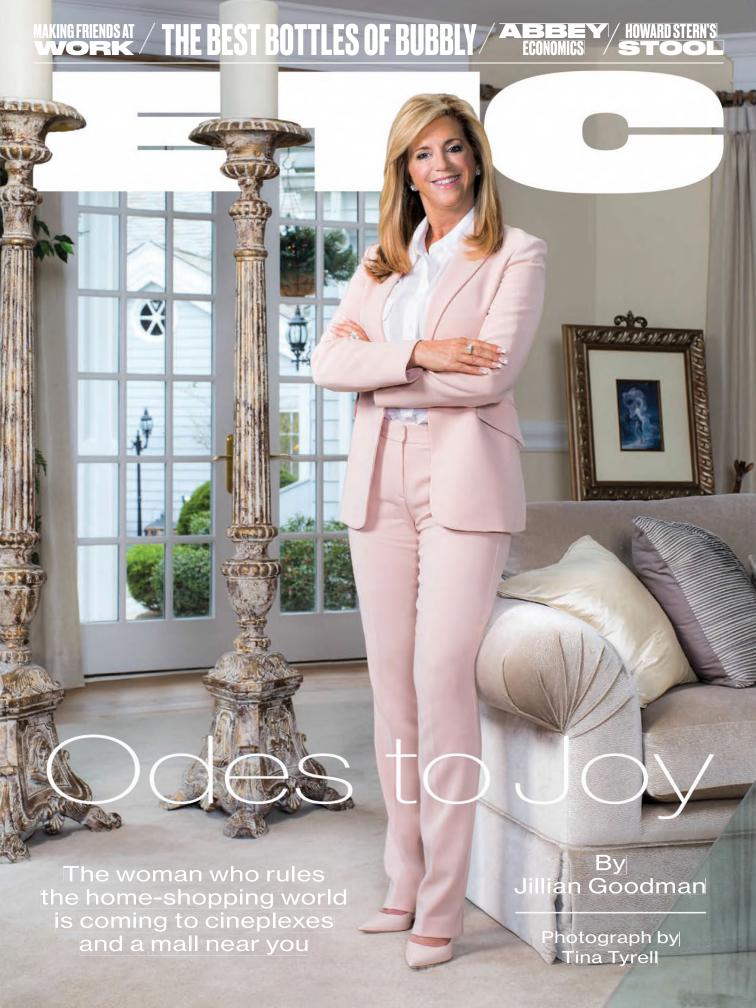
Did you know that trees absorb

1/5 of carbon emissions?

Sixty years ago, The Nature Conservancy's first act was conserving a forest in New York. Today, we help people all over the world to protect the life-giving services their forests provide.

Help nature to breathe easier. Learn how at **nature.org**.





our days after Thanksgiving, Joy Mangano's home is fully decorated for Christmas, down to the little wreath on the front grille of her car. Originally designed by Stanford White, her stately, rambling house has been added to over the years, and it now has 13 bathrooms and more than 40,000 square feet. Besides her adult

children—Christie, Bobby, and Jackie—her company—Ingenious Designs, of which she's the founder and president—and her products, the house is Mangano's pride and joy.

Inside, the merchandise that's made Mangano the biggest star on HSN is everywhere: There's a pair of Joy Readers folded neatly

on a coffee table near the enormous Christmas tree; there are a few guitars from her collection with country singer Keith Urban propped up near the piano; and there's at least one bundle of Forever Fragrant Fresh Sticks in every room. "I love product," she says. "I see the world through product."

A lot's happening for Mangano this holiday season. On Christmas Day comes the release of Joy, a movie inspired by her early days as an inventor and single mom, directed by David O. Russell and starring Jennifer Lawrence. Then on Jan. 9, Mangano will release a collection of Joy products at Target, Macy's, Bed Bath & Beyond, and the Container Store. For the first time, in-store shoppers will be able to get their hands on My Little Steamer, a portable wrinkle eraser; the Better Beauty Case; the MemoryCloud Pillow; and those Forever Fragrant Fresh Sticks, which Mangano describes as "the marriage of a fine fragrance and an odor elimination." Her velvet-flocked Huggable Hangers-her top-selling

product (it's spawned a thousand imitators)—are part of the collection as well, though they're already on sale at Target and the Container Store. The pièce de résistance is a redesigned Miracle Mop, the product that made her famous almost 25 years ago and the engine of *Joy*'s plot.

Mangano first showed the Miracle Mop on QVC in 1992. At the time, she was a single mother of three from Long Island in New York, struggling to support her family with part-time jobs. She and husband Tony Miranne had divorced a few years earlier, and she'd gone deep into debt to finance the prototypes, a mop

with a retractable, twistable handle to wring out water and a head made from 300 feet of continuously looped cotton yarn.

Selling products on TV was still fairly new and risky—QVC had been founded only six years earlier—but Mangano needed the shot. She talked the network's buyers into purchasing 2,500 mops on consignment. Sales were modest until she insisted she be allowed to go on-air and pitch them herself. In her first 20 minutes, she sold 18,000.

Mangano's pitch is more enthusiastic than polished. "Picture yourself sitting there, watching," she says. "You can tell when somebody's authentic about what they're saying. For me, I'm part of that product. I'm so passionate about it, it's like talking about my children." To date, she's sold more than \$3 billion

worth of merchandise.

Barry Diller bought HSN in 1995; three years later he acquired her company, bringing Mangano over to the network. (Diller was also chief executive officer of QVC in the early '90s.) HSN's audience is 87 percent female, according to the network's CEO, Mindy Grossman, who spun the company away from Diller's IAC/InterActiveCorp in 2008 and took it public. "These are women who want to make their life more efficient, because they're busy. They're working," Grossman says. "I've traveled with Joy-women come up to her in airports, and the first thing they say is, 'Thank you for making my life easier."

Mangano has the largest customer base at HSN. Her fans have been known to preorder products in such numbers they sell out before Mangano even reveals what they do. Retail is a different arena. She'll be able to reach many times the number of people—her partners have a combined customer base that far outnumbers HSN's 60 million shoppers—but in

the stores, those customers will be on their own. There will be no Joy Mangano there to explain the products' many "features and benefits." So she and her team have redesigned the branding, the logo, and the packaging—everything down to the little chalk sketches on the label meant to evoke the drawings she makes when she's developing an idea.

They also set about re-creating the Miracle Mop, which had remained essentially untinkered-with since 1992. One great advantage of the original mop was that you could wring it out standing up. The new version is completely "self-wringing"—an

Wring Cycle

The updated Miracle Mop can't walk on water, but it sure can sop it up







"inner helix" stretches the strands of the mop head taut as you extend the handle. "It should be a \$50 mop, but I was possessed to have the same price as we did when we launched the original," Mangano says. "America and the world is going to get it for \$19.95. It's incredible. We're so excited about it, really. When is a mop the star of a movie, right?"

Joy isn't technically about Mangano. The film never uses her full name or calls anything a Miracle Mop—but it is the story of a single mother named Joy who lives on Long Island, invents a mop you don't have to squeeze with your hands, and makes a fortune selling them on TV. "I actually didn't believe the producers when they said, 'Joy, we're writing a movie about your life,'" she says. "I was like, 'Oh, OK, fine, call me tomorrow."

That the retail launch occurs so soon after the film's release is somewhere between canny planning and a happy accident: Everyone at Ingenious Designs swears they were planning the brick-and-mortar move before the movie came into play. But,

"Ilove product.
I see the
world through
product"

says Mangano's daughter Christie, who's the senior vice president for brands at Ingenious Designs, the release put a convenient "cap" on their development process. "You can't do a rebrand after something like that," she says.

Mangano's son, Bobby, also works at the company, as executive vice president of business strategy and development. (Jackie, the youngest, works for HSN as an on-air fashion expert.) Christie's and Bobby's offices are right next door to their mother's. Even Miranne, Mangano's ex-husband, is at the company as its executive vice president for retail sales. "We were always around it," Bobby says. "My first job ever was with the mop looms, when you'd move them to the sewing table. In order to move them, you needed to keep all the strings aligned, and some brilliant person—probably Joy—said, 'Let's use straws.' For some reason, somebody ordered straws with wrappings on them, so my job was to unwrap the straws. I remember thinking, even at 4 or 5, Why didn't we just order them without the wrappers?"

Christie and Bobby are both extremely proud of their mother. (They call her Joy at the office and Mom at home.) "I couldn't be more flattered and honored, truly," Mangano says of all the attention the movie has generated. "There's a point where it's surreal. But I still do what I so love to do, which is create products." At the moment, she's working on a line of luggage she can't talk about yet, and she's relaunching a toaster oven she first released in 2009. Mangano will also be going on tour with her retail collection in January, hitting up her partners' stores coast to coast. Shoppers should be in for quite a show. "I promise you," she says, "if they put a mop in my hand, and a floor underneath me, I will be there doing it."



Life's too short for bad bubbles. Try one of these for your New Year's toast By Elizabeth G. Dunn

2009 IRON HORSE VINEYARDS

CLASSIC BRUT, \$42

This rich, creamy sparkler from

California is a surefire winner.

The yeasty aroma and slightly nutty

taste will pair well with whatever

savory snacks your host is serving.

LABEL LINGO LESSON #2 Where's It From?

Champagne: Sparkling wines from the Champagne region of France tend to be among the driest.

Crémant: Sparkling wines made in other parts of France; these are also reliably dry.

Cava: Spanish sparkling wines, typically dry and smoky.

Prosecco: The most common sparkling wine from Italy, made in the Veneto region. Often sweeter than cavas, Champagnes, and crémants.

California sparkling wine: Typically sweetish and approachable.

AT YOUR

RAVENTOS I BLANC

2013 RAVENTOS I BLANC "DE NIT" Rosado Cava, \$23

Easy and cheap, Spanish cavas were once maligned, but they're getting more positive critical attention of late. Fruity, but not too sweet, this rosé version is a major bargain.

How Sweet Is It?

Ultra brut (or brut nature, or brut zero): Absolutely bone dry, for those who resist even a little sweetness.

quite dry sparkling wine.

Extra dry: Confusingly, these wines are sweeter than

Sec: The word means "dry" in French, but these bottles are even sweeter than those labeled extra dry.

LABEL LINGO LESSON #1

Extra brut: Still reliably dry.

Brut: The most common designation; denotes a

those labeled brut.

......

Demi-sec: Sweeter still.

Doux: The sweetest sparkling option.



NV JACQUESSON CUVEE 737 Extra Brut, \$62

The winemakers create a distinctive blend each year. This bold, full-bodied, and aromatic issue is from 2013because nothing says "I appreciate you" like a limited edition.





1995 CHARLES HEIDSIECK BLANC **DES MILLENAIRES, \$175**

This is among the most sought-after (and award-winning) Champagnes on the market-and bottles are running out. Complex, vibrant, and dangerously easy drinking, it's a perfect pat on the back.

ALMON

LABEL LINGO LESSON #3 What's in It?

Blanc de blancs: Crisp, fresh sparkling wines made from white wine grapes.

Chosen with the

help of Emilie

Perrier, sommelier

at Gabriel Kreuther

in New York

Blanc de noirs: Richer, fuller wines made from red wine grapes (though the wine itself is still white).

Rosé: The fullest-flavor option, made from a variety of different grapes, with fruity, berry flavors and a pink hue.

NV: Means "nonvintage" and includes a blend of grapes harvested in different years; NV sparkling wines from a single producer tend to taste consistent

NV BILLECART-SALMON BLANC DE BLANCS BRUT. \$70

A favorite among chefs and sommeliers for its finesse and food-friendliness, this fresh, elegant, medium-bodied Champagne has zesty green apple notes. (Remember that so you can repeat it later.)

2009 PIERRE PETERS CUVEE SPECIALE LES CHETILLONS BLANC DE **BLANCS MAGNUM, \$250**

It's made from grapes harvested from one of the choicest parcels in all of Champagne. Dried fruit and honey notes will help ring in the new year on an extravagantly romantic note.

How to Open the Bottle

- 1. To avoid an exploding cork and spilled fizz, chill the bottle to about 45F.
- 2. Once you're ready to open, remove the foil from the top and loosen the wire cage around the cork.
- 3. Hold the bottle close against your body to stabilize it. Use a cloth napkin for extra grip on the cork.
- 4. With the cage still on, slowly twist the cork in one direction and the bottle in the other.
- 5. Keep twisting until the cork releases.
- 6. Take a bow and serve.

For Hairof-the-Dog **Mimosas**

NV KOENIG CREMANT D'ALSACE, \$15

Crémant d'Alsace wines like this are crisp, zesty, and inexpensiveideal for splashing into OJ the morning after.



PHOTO GRAPHS BY JOSH DICKINSON FOR BLOOMBERG BUSINESSWEEK; LETTERING BY BRAULIO

f the first five seasons of *Downton Abbey*—the British upstairsdownstairs soap opera that will have its sixth and final U.S. season premiere on Jan. 3—were about the structure of class divisions in English society, the last one is about those divisions crumbling.

In this season's opening episode (warning: spoilers), it's 1925, and the Abbey is cutting staff, leaving some in existential crises over their professional purpose. Middle daughter Lady Edith, a "modern" working woman, has left the family seat to oversee a magazine in London. Lady Mary, the eldest, whose hauteur has at times seemed impenetrable, uses her status to help her lady's maid procure better medical care. Lord Robert, the Crawley family patriarch and seventh Earl of Grantham, asks mere minutes after the season begins, "Who lives as we used to now?"

Part of *Downton*'s genius is that it masquerades as a period drama, when in fact it's a broad critique of the human manifestation of economics—a particularly resonant theme at this point in the English-speaking world. *Downton* premiered in the U.K. in 2010 and in the U.S. a year later, just before the rise of Occupy. Thomas Piketty aside, class division continues today as it

did 90 years ago. This year, someone in the top 10 percent of earners in the U.K. will make 27 times the income of someone in the bottom 10 percent. In the U.S., the richest 20 percent of families control 89 percent of the country's wealth, according to a recent Pew survey, putting it among the richest, yet most unequal, countries in the world.

Downton was a hit in its home country and became a global television phenomenon: On its first airing in the U.K., it quickly set ratings records, drawing an average of 8.8 million viewers per episode. A year later, when Downton came across the Atlantic and aired on PBS, it became the most popular drama in public broadcasting history.

Credit the show's rich visual style and the comic timing of Dame Maggie Smith—whose performance as the Dowager Countess Violet alone was worth the time spent watching—for the continued strong ratings in the fourth and fifth seasons. Occasionally, however, creator Julian Fellowes seemed to be taking on too much. What are the implications of economic mobility, the show asked, and the mechanisms for achieving it? In a world of emerging technologies (by 1925, phonographs, telephones, automobiles, and refrigerators have come to Downton), how does a labor force

change? What are the responsibilities of those with hefty manors and Roman numerals after their names?

These are some of the same questions that animate Downton's literary antecedents, the great novels of Edith Wharton, the Brontë sisters, and, of course, Jane Austen. The sixth season (which has already aired in the U.K.) points to Austen deliberately when, over tea, the Dowager Countess and a cousin discuss the strangeness of hosting an open house at Downton to benefit the village hospital. "Even Elizabeth Bennet wanted to see what Pemberley was like inside," the cousin remarks. The Dowager tartly replies, "A decision which caused her a great deal of embarrassment, if I remember the novel correctly."

Like its literary predecessors, *Downton* has been accused of being mere post-Edwardian fluff, but it's more substantial than that. Instead of ignoring real issues or filming them in sepia, *Downton* has addressed interracial dating, rape, gay identity, premarital sex, suicide, and post-traumatic stress, reveling in their inherent complexity rather than fleeing from it. The show leaves viewers with a sense of optimism about the future, a world where the difference between high and low is just a staircase anyone can climb. ①



SOCIAL WORKERS

Your friends from the office are now your friends at the office By Rebecca Greenfield

f your office didn't have a holiday party this year, you are way not alone. In 1998 more than 80 percent of companies surveyed by the Society for Human Resource Management had end-of-year celebrations. This year only 65 percent of companies threw a party.

Fern Diaz, now a senior manager at ad agency Huge, doesn't miss them. "You're being forced to hang out with the people you work with, because you're complying with some company culture-building," she says.

To some, this might seem like yet another indication that the office is turning into an increasingly antisocial place. Adam Grant, a management professor at the Wharton School, wrote an op-ed in the *New York Times* in September claiming the workplace has become a mostly transactional environment, where relationships don't extend

beyond office walls. One 2011 study he cited found that 32 percent of respondents in the U.S. said they invited colleagues to their homes, vs. 66 percent of Poles and 71 percent of Indians. Only 6 percent of Americans in the study reported going on vacation with their co-workers.

But looking to organized events and outof-the-office activities misses a bigger trend: Most co-worker socializing now happens at the office. Our working relationships are much more intimate: Walls have literally come

down, as open office plans have done away with cubes. Workers are in constant communication via instant messaging and e-mail.

Diaz considers half of her 500 co-workers her friends. Her idea of fun

with colleagues is an in-office *Serial* discussion group or casual desk-side drinks, not a work-sponsored party or a staged dinner. "Huge doesn't pay for the bourbon. We just buy it and drink it at 5 p.m. on a Tuesday," she says. "That's how I've made a lot of friends."

Work itself is social. Every day, almost 2 million people log on to Slack, one of a handful of online communication tools designed for the office. People use chat rooms as a digital water cooler as much as a place to get work done, so much so that many companies have designated rooms for nonwork conversations. One of the most beloved features on Slack is the GIF generator, often used to add levity to a work chat.

Just because relationships are online doesn't mean they should matter less. In a 2011 study, researchers from the

University of Rochester had strangers communicate with one another online and found that the more time someone spent chatting with someone, the more they reported liking that person. Tanya Ghahremani and Kadeen Griffiths, two editors

with a "weirdly close" friendship at the blog Bustle, formed their relationship over instant messages. Now "we're always in communication over e-mail, text message, carrier pigeon," Ghahremani says.

Organizations have an interest in promoting work friendships, because

they're good for business. Friends motivate each other with social pressure; not performing means letting a friend, not just a collegue down Having best friends.

league, down. Having best friends at work is one of the strongest predictors of a solid team performance, according to Gallup's annual engagement survey.

Yet the harder offices try to make workers socialize, the more it backfires. "You can't force friendships," says Jim Harter, the chief scientist at Gallup. The best thing for employers to do is let employees make their own fun. That describes the environment at Web Talent

Marketing, in Lancaster, Pa., where Anna Horn works. "We will have a Cinco de Mayo party in the middle of the day," says Horn, who met her best friends at work. "We're all just hanging out and having margs. My boss is cool with that."











DR. DELOS 'TOBY' COSGROVE

President and chief executive officer, Cleveland Clinic



Demonstrating the blood conservation technology he invented, 1980. Today, Cosgrove has 30 patents for surgical products.

"One day, the guy below deck announced that it was a sewer and he wasn't going down there anymore, so I took his job. My nickname was Sewer Man, and ever since, America's Cup boats have that position."

> "We had 100 beds and two doctors and evacuated 22,000 sick and wounded. On my days off, I flew combat missions and worked in a Vietnamese hospital."



Performing surgery at the Cleveland Clinic, 2006



"They were doing 3,000 coronary bypasses a year, so I instantly became one of the busiest heart surgeons in the country."

Education

Watertown High School, Watertown, N.Y., class of 1958

Williams College, Williamstown, Mass., class of 1962

University of Virginia School of Medicine, Charlottesville, class of 1966

Work Experience

1963-64

Crew member on the Nefertiti, America's Cup competitor

1966-68

Surgical intern, resident, Strong Memorial Hospital, Rochester, N.Y.

1968-70

Chief of U.S. Air Force casualty staging flight, Da Nang, Vietnam; surgeon, Hamilton AFB, Calif.

1970-74

Surgical resident, Massachusetts General Hospital

1974

Chief resident of cardiac surgery, Boston Children's Hospital

1975-2007

Cardiac surgeon, Cleveland Clinic

2004-Present

President and CEO, Cleveland Clinic

Life Lessons

"I was a pretty good student in a not very academically inclined high school."



"I was a history major. It was the only thing I could major in, because my grades were so bad in everything else."



Providing health services to families in Vietnam, 1968

"One day I was reading the newspaper to a teacher I was dating, and she said, 'You're dyslexic.' She was right."



"Heart surgery is an athletic event, and I was getting to the point where perhaps I needed to stop. I was considering venture capital, and then the CEO announced his retirement and asked me to throw my hat in." FSC MIX Paper FSC COBAZES





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